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# COMMISSIONER OF PUBLIC HEALTH

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## WESTERN AUSTRALIA

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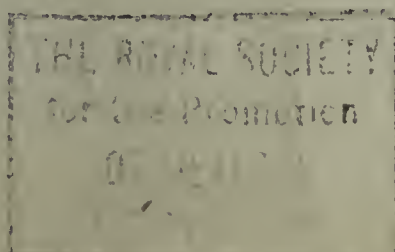
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# R E P O R T

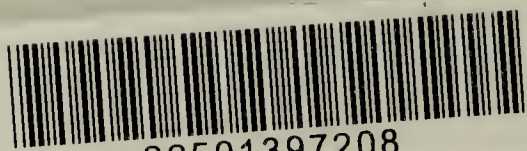
## FOR THE YEAR 1960

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# R E P O R T

OF THE

## Commissioner of Public Health for the year 1960

Presented to both Houses of Parliament





*The Honourable Ross Hutchinson, D.F.C., M.L.A.,*  
*MINISTER FOR HEALTH*



Sir,

I have the honour to submit the Report of the  
Department of Public Health for the Year 1960.

*LINLEY HENZELL, M.D. (London), B.Sc., D.P.H.,*  
*Commissioner of Public Health.*



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DEPARTMENT OF PUBLIC HEALTH



Report of the Commissioner



TO THE HONOURABLE THE MINISTER FOR HEALTH

I have the honour to submit the report of the Department of Public Health for 1960.

From the end of April until the end of the year I was absent on long service and study leave and the activities of the Department were during this period in the able hands of the Deputy Commissioner of Public Health, Dr. W. S. Davidson.

It is gratifying to record that the departmental activities were carried on throughout this period with efficiency.

VITAL STATISTICS

The population increased in the course of the year from 718,830 to 731,403, an increase of 1·75 per cent. The following are the main vital statistics, the figures in brackets being those for the whole of Australia :—

Birth Rate—23·14 (22·40) per 1,000.

Death Rate—7·79 (8·61) per 1,000.

Natural increase in population, *i.e.*, excess of Births over Deaths—1·52 per cent. (1·36 per cent.).

The maternal mortality was 0·47 (0·52) per 1,000 live births, which was almost the same as that for 1958—0·48, but higher than for 1959—0·29. However, owing to the small number of maternal deaths in the year (8), this probably has little significance.

The infant mortality rate was 21·62 (20·16) per 1,000 live births—a slight increase from the previous year—20·16.

The general health of the community, as expressed by these figures, continues to be satisfactory.

STATE HEALTH COUNCIL

During the year three meetings of the State Health Council were held, together with the following Committee meetings :—

Mental Health Committee	....	....	....	....	....	2
Maternal and Infant Health Committee	....	....	....	....	....	2
Hospitals Requirements Committee	....	....	....	....	....	3

On 30/6/60 the period of appointment of the State Health Council expired and a new Council was elected for a three-year period ending 30/6/63, under the chairmanship of the Commissioner of Public Health. The constitution of the Council is as follows :—

- Mr. George Pestell—representing the Royal Australasian College of Surgeons.
  - Dr. Cyril Fortune—representing the Royal Australasian College of Physicians.
  - Dr. Roland Natrass—representing the Royal College of Obstetricians and Gynaecologists.
  - Dr. D. M. Clement
  - Dr. H. Leigh Cook
  - Dr. I. O. Thorburn
  - Dr. M. F. Williams
- } Nominated by the British Medical Association.
- Professor Gordon King
  - „ C. W. D. Lewis
  - „ E. G. Saint
  - „ W. B. MacDonald—Professor of Child Health, University of Western Australia.
- } Representing the Faculty of Medicine of the University of Western Australia.
- Inspector-General of Mental Services (Dr. D. W. Moynagh) or his Deputy.
- The Deputy Commissioner of Public Health, Dr. W. S. Davidson.
- The Under Secretary for Health, Mr. J. J. Devereux.
- Dr. J. D. Martin was appointed as a representative of the Faculty of Medicine of the University of Western Australia during the absence on study leave of Professor Gordon King.



Among the recommendations of the Council which were made after consideration by the Appropriate Committee, the following may be mentioned.

The Council approved of proposals inaugurated by the University Department of Child Health, in collaboration with this Department's Medical Supervisor of Infant Health and a select group of general practitioners of the Metropolitan Area, for the routine examination of children in the pre-school age group, to be carried out by family doctors, with particular emphasis on certain significant possible deviations.

#### *Specialist Services in the North-West and Northern Parts of the State*

Council considered that periodic visits of specialists to the North and North-West were most desirable and recommended that the Department inaugurate such a service.

#### *Hospital Planning*

The following recommendations were made :—

1. There should be a staged development of an Infectious Diseases Hospital at Subiaco to reach a total of 180 beds after the elimination of the two old wards still present and in use on the site. In chronological order, this development would be :

Nursing Staff quarters.

Gymnasium.

Physiotherapy and Occupational Therapy accommodation.

New Wards.

X-Ray and Laboratory.

Kitchen and Dining-rooms.

Administration.

Outpatient Clinics.

2. The planning and construction of a new general hospital to be used for teaching purposes on University land at Hollywood.
3. The selection of a site for a hospital south of the river should be reviewed in collaboration with the University and the Town Planning Commission.
4. The provision of additional beds at the Armadale Hospital.

The whole question of metropolitan hospital planning was to be reported on by a special committee appointed by the Minister, consisting of the Acting Commissioner of Public Health, Dr. W. S. Davidson, Professor Gordon Stephenson and Mr. J. Griffith, Administrator of the Royal Perth Hospital. This committee should consider all aspects, including the needs of the Faculty of Medicine in the University of Western Australia.

#### *Mental Health*

The Mental Health Committee recommended to the Council that Open Chain Ureides be placed on the registered list and obtainable by prescription only. Council approved this recommendation.

The report of the special committee on Mental Hospital Planning set up by the Hon. the Minister for Health was considered and approved by the Mental Health Committee and, subsequently, by the Council.

#### *Speech Therapy*

The Council recommended that the Government should grant bursaries to four students each year to enable them to undergo a course of training as speech therapists.

### LOCAL AUTHORITIES

Co-operation with Local Health Authorities throughout the State continued to be close and productive.

This was well shown in the activities of the Metropolitan Refuse Disposal Committee and of the six Zone Committees which had been formed to co-ordinate the activities of the various Local Authorities. With the collaboration of officers of this Department, these Zone Committees have actively pursued a policy of conjoint action and are proceeding in a planned policy of reclamation and development using the sanitary landfill method. The experience of all Committees has been that this is more economical to operate and has given universal satisfaction.

Acknowledgments are due to other Government Departments for their assistance, such as the Metropolitan Water Supply Department and the Town Planning Board.

The Central Committee and the Zone Committees are to continue these activities in the ensuing years.

A summary of a report from Inspector J. Slattery of this Department, who was one of the Liaison Officers, is included in Appendix XV.

This collaboration was also exemplified in the formation of a Fly Control Committee in 1960. On this Committee were represented officers of the Agricultural Department, a nominee each from the Health Inspectors' Association, Health Education Council, Local Government Association and the Road Board Association, as well as officers of the Public Health Department.

Inspector Moyle of this Department acted as Liaison Officer between the different Local Authorities and Government Departments, and a report from him is included in Appendix XIV.

This Committee conducted a campaign during the summer months and it is considered that it met with considerable success as it brought home to the public a sense of their individual responsibility to control the domestic breeding of house-flies.



The temporary employment by some Local Authorities of University students on vacation to act as Education Officers and to conduct house to house inspections was most successful and it is hoped that more Local Authorities will adopt this practice in the coming summer.

There is reason to believe that the public is becoming aware that although pesticide sprays have their place in fly control, the fundamental and only really effective principle is to prevent fly breeding.

The major source of flies in the Metropolitan Area is the domestic back-yard and garden breeding by the householder, by the use of animal manure and compost in gardens, carelessness in handling of domestic refuse, accumulation of lawn clippings, etc.

The solution of the problem of the control of this pest is in the public's own hands and each citizen has a personal responsibility in this respect.

## LEGISLATION AMENDMENTS

Two Bills were passed by Parliament during the year amending the Health Act. The main features of the Bills were :

- (1) To set up a Maternal Mortality Committee charged with the responsibility of investigating maternal deaths. Members of the Committee are all professional persons and the confidential proceedings of the Committee are protected from production in any court of law.
- (2) Local Authorities were authorised to supply disinfectants and pesticides for the control of diseases and pests.
- (3) Restaurants which had been granted a liquor licence by the Licensing Court were brought under the jurisdiction of Local Health Authorities.

## FOOD AND INSPECTORAL STAFF

The report of the Chief Inspector, Mr. C. E. Flower, is given in Appendix XIII.

There was increased activity in the sampling of specimens of water from river and ocean bathing places and in the continued use of Moore swabs in all the main water supply reservoirs.

Because of shortage of staff, it is not possible for the inspectorial staff of this Department to carry out routine surveys of the work of local health authorities, which should be one of their principal activities. Reliance has to be placed on the reception of complaints either from property owners or from the Local Authorities themselves in the form of applications for assistance. This results in the Department's staff going into action only after damage has been done and their proper educative function in prevention is too little used. An increase in the number of departmental inspectors is necessary.

### *Meat Inspectors*

The Department's Meat Inspectors have to inspect an increasing number of carcasses every year. This is inevitable with the growth of the population. Their duties are carried out with efficiency.

### *Health Inspectors' Conference*

The Health Inspectors' Conference held in September was again successful and is much appreciated by the Inspectors from all Local Authorities.

### *Food and Drugs*

There were two meetings during the year of the Food and Drugs Advisory Committee. New regulations drafted and recommended for adoption by the Food Standards Committee of the National Health and Medical Research Council covering the following items were accepted, together with amendments for regulations governing flour, bread and canned meat products :—

- Poisonous Metals in Food
- Artificial Sweetening Substances
- Sugar and Glucose
- Edible Fats and Oils
- Ice Cream and Related Products.

The Department wishes to express its thanks to Mr. W. A. Ashton, Mr. M. G. Muggleton, Dr. L. Samuel, Government Analyst, and Dr. W. Laurie, Director of Public Health Laboratories, for their assistance on this Committee.

### *Pesticides*

The Pesticide Advisory Committee met four times. One hundred and forty-five applications were considered and 140 were approved. At the end of the year there were registered 893 approved pesticides.

The Department would like to record its thanks to Mr. C. F. H. Jenkins, Government Entomologist, Dr. L. Samuel, and Mr. F. W. Avenell, Registrar of the Pharmaceutical Council of Western Australia, for their assistance.

## PUBLIC HEALTH LABORATORIES

An efficient laboratory service is an essential part of any public health department because of the indispensable information it gives in the control of communicable disease. In addition to this specific function, a public health department must ensure that an efficient diagnostic laboratory service is available to the public. If this is not readily available either by hospital laboratories or by the facilities of pathologists in private practice, then it is the responsibility of a public health department to provide such a service. Accordingly, the Department's laboratory service has been developed with this end in view.



In his report, Appendix II, Dr. Laurie, Director of the Public Health Laboratories, after drawing attention to the fact that satellite small diagnostic laboratories are now available at Derby in the Kimberleys, at Geraldton, Northam, Wooroloo, Bunbury (with sub-branches at Collie and Busselton), and at Albany, points out the need for the provision of these local facilities at Port Hedland and neighbouring townships, at Narrogin and Manjimup. It is planned to develop this service in these areas in the forthcoming year and, at a later date, Esperance will need to be considered.

In order to maintain accuracy and reliability of the technologists in these satellite laboratories, they are supplied each week with "unknown" specimens which have been previously tested at the central laboratory. By this means it is possible to detect if there is any developing local defect. In addition, the central laboratory submit to periodic tests of efficiency organised by the Australian and American Colleges of Pathologists.

Dr. Laurie deals with steps which have been taken to overcome the difficulties associated with shortage of accommodation in the Perth Chest Hospital by the use of premises elsewhere.

The assistance given by the sheltered workshop of the Mental Health Services at Claremont is greatly appreciated.

In the section of Microbiology outstanding developments have taken place in the course of the year in the work of Dr. Kovacs on atypical mycobacteria, and he was invited to address the Vienna Congress on this subject during the year. Dr. Kovacs' work has received international recognition and he has also been invited to lecture at the 1961 Conference of the Bacteriological Society of Germany. It is hoped that he will be able to make this trip.

Further work continues on the problem associated with the hospital staphylococcus.

In the course of the year, the Mycology Department was brought into being and already its work has proved to be of considerable assistance to clinicians.

The Salmonella Investigation Unit developed more fully in the course of the year and not only has its work proved to be of great clinical importance but, from the public health point of view, it is essential that it be fully developed. Salmonella infections play a significant part in the causation of human disease and until more information is obtained through the laboratory concerning the sources of these infections, little preventive work can be done. These activities are to be continued vigorously.

Reference has already been made to the original work of Dr. Kovacs in atypical mycobacteria. It has been shown that these organisms may cause tuberculosis-like disease in man and there is close collaboration between the Laboratory and the clinicians of the Tuberculosis Control Branch in this respect.

It is pleasing to report that the laboratory work in tuberculosis is being maintained at an extremely high level.

The Virology Laboratory continued its work at the Perth Chest Clinic and is proving of considerable assistance to the clinicians and also in the study of communicable disease. Its work on trachoma continues.

The services of the Biochemistry Section are in increasing demand by the clinicians in the Perth Chest Hospital and also by the Occupational Health Branch of this Department. This very significant aspect of medicine will entail further developments of the Laboratory resources.

The Haematology Department also is more in demand by the clinicians and its role in the evaluation of nutritional anaemias in the aboriginal population is being made more manifest. Its assistance is being sought by the clinicians of the Mental Health Service, and the provision of further laboratory assistance to this service is being planned.

In the Serology Section further work has been done on Leptospirosis, Brucellosis, "Q" Fever, Trachoma-Psittacosis, Influenza and Viral Hepatitis.

The Laboratory services continue to be used for medico-legal purposes.

It is planned next year to develop a Section of Histopathology.

Dr. Laurie is to be congratulated on the progressive development of the Service.

#### TUBERCULOSIS CONTROL BRANCH

The report of the Director of the Tuberculosis Control Branch, Dr. F. G. B. Edwards, is included in Appendix III.

We would like to congratulate the former Director, Dr. Alan King, on his appointment as Director of Tuberculosis to the Commonwealth Department of Health. He held the position of Director in this Department for 11 years and in that time built up a most efficient service. It is expected that with his appointment, the close collaboration between the Commonwealth and State Departments of Health in the tuberculosis field will continue.

The report for 1960 was prepared by Dr. Edwards, who was appointed to succeed Dr. King.

The death rate for the year was 4.1 per 100,000—a figure a little in excess of those of the previous two years, 3.4 and 3.3 respectively, but highly satisfactory on a world standard.

Dr. Edwards' comments on the reduction in the number of cases on the register. In the course of the year, 670 names were removed and the total number remaining on the register at the end of the year declined from 2,792 at the end of 1959 to 2,506 at the end of 1960. It is gratifying to note the continued removal of the names of persons from the register in whom the disease has continued to be arrested.

It is interesting to note that the incidence of the disease discovered in mass X-ray surveys stayed at the figure of 1.1 per 1,000 persons examined. This is a reduction from 2.4 when the programme commenced in 1952.

The persistent incidence of the disease in the Kalgoorlie area continues to be a public health problem.



A considerable amount of work was undertaken in collaboration with the Public Health Laboratories on the isolation of unclassified (anonymous) mycobacteria. This subject is also dealt with by the Director of the Public Health Laboratory Service and is a matter of considerable public health interest.

The report of the Physician Superintendent of the Perth Chest Hospital, Dr. H. R. Elphick (see Appendix IV), shows that the hospital is being conducted efficiently and smoothly.

Owing to the efficient methods of case finding and of treatment, there is an increasing number of beds available at the hospital for patients who are not suffering from tuberculosis. It is expected that in 1961 these beds will be made available for general hospital purposes.

All tuberculosis patients have now left Wooroloo which has been converted into a geriatric hospital.

Dr. Heymanson's report (Appendix V) of the Pulmonary Function Laboratory situated in the Perth Chest Hospital outlines the principles on which the laboratory works and gives some information concerning the results which the laboratory obtains and the assistance which its findings gives to the clinicians. This work is highly technical and mathematical and should be encouraged and supported. There can be no doubt that the aid which is given by these laboratory methods in certain cases is of considerable assistance in the clinical assessment of the patient's condition and in his treatment and in improving his hopes of survival.

## COMMUNICABLE DISEASES

The report of the Director of Epidemiology, Dr. Snow, is contained in Appendix VI.

It is pleasing to remark the continued success of the campaign to control poliomyelitis.

In the course of the year, 140,590 injections were given and, in all, 411,000 persons had received all three injections. 50,000 had received two and 29,000 one injection ; in all, 490,000 persons had received either one, two or three injections.

Since the campaign commenced in May, 1956, there have occurred 14 cases of paralytic poliomyelitis, of which 11 had not received any vaccine. Of the three who had received Salk vaccine, two had received only one injection, one person had had all three.

It will thus be seen that approximately two-thirds of the population of the State have been immunised in part, and that 55 per cent. have received a full course. However, there is a lack of response in adults presenting themselves for vaccination. Ninety per cent. of the children in the State have received protection but adults are dilatory once their children have been vaccinated.

In the course of the year, the control of communicable disease was strengthened by the creation of an Epidemiology Branch of this Department, with a permanent establishment.

Trachoma and Venereal Disease control were transferred to this Branch.

## INFANT HEALTH SERVICE

The report of the Medical Supervisor of Infant Health, Dr. E. M. Gibson, appears in Appendix XX.

The number of new babies attending the Infant Health Clinics continues to be high. In 1960 75 per cent. of all babies born in the State attended the various centres.

There are now 124 Infant Health Centre buildings in use. In the course of the year seven new buildings were opened.

The work of the Correspondence Section continues and is increasing. It is remarkable that every mother in outlying parts of the State now has access to this valuable service regardless of the difficulties of communication and transport.

It is pleasing to record the commencement of a pilot scheme for the routine examination of pre-school children which commenced in August. As a result of a scheme which was prepared by Professor Macdonald of the Department of Child Health of the University of Western Australia, and the collaboration of various general medical practitioners, a beginning was made of the routine examination of the children in the pre-school age group. From results received to date, this promises to be an important development in the improvement of child health in this State.

A tribute should be paid to Dr. A. Eksteins, Medical Officer, Kindergartens, whose death occurred during the year. Dr. Eksteins, after five years' service in general practice at Meekatharra, undertook this valuable work in spite of the handicap of ill health.

## SCHOOL MEDICAL SERVICE

The routine activities of this Section continued smoothly throughout the year. (See Appendix XI.)

In the course of the year, 60,207 children were examined, including 23,412 in the country.

Defects requiring notification to the parents were noticed in 20,342 children. Of these, 5,267 were medical defects, the others being dental.

The Medical Officers commented on an apparent decrease in the number of abnormal ear, nose and throat conditions, possibly being the result of the use of antibiotics which have prevented acute infections from becoming chronic.

## SCHOOL DENTAL SERVICE

The School Dental Service was increasingly handicapped in the course of the year by an unavoidable reduction in the number of dentists on the staff. This was caused by retirements because of age, resignations and one death and, at the end of the year, there were only nine dentists on the staff. (See Appendix XII.)



It is impossible to give an adequate service with this small number and Mr. McKenna and his staff are to be congratulated on the efforts they have made in spite of these great handicaps.

Until the people of this State adopt a realistic attitude to the replacement of a deficiency in our water supply by the addition of fluoride they may expect their children to continue to have dental caries to a degree which is a reproach to our social standards. It is disheartening for an understaffed School Dental Service to endeavour to patch up these avoidable deficiencies in dental health.

#### HEALTH OF NATIVES IN THE KIMBERLEYS

The report of Dr. J. J. Elphinstone, Medical Officer, Native Surveys, is contained in Appendix VII.

Dr. Elphinstone emphasises the considerable physical difficulties involved in the efficient carrying out of medical surveys and general health control of aborigines in Kimberley.

The health problems of aborigines in this State are unique. Nowhere else has a primitive nomadic race with no organised agriculture or animal husbandry and with no settled place of abode, been brought into permanent and settled association with European civilization. It is only too easy to criticise the inevitable harmful results. However, to those experienced in these problems, the end results are certainly not as bad as might have been expected in the circumstances.

It is interesting to note that Dr. Elphinstone has not observed any overt cases of malnutrition and, in fact, obesity in natives has occurred because of an uninformed over-consumption of the white man's rations.

There is reason to be sanguine over the control of leprosy. The decline in the number of patients requiring residential treatment in the Derby Leprosarium is continuous. There is difficulty in maintaining surveillance after discharge and of maintaining follow-up records because of the frequent absence of a fixed name for any particular native.

A campaign to control hookworm infection in certain endemic areas is being continued. In some centres it is difficult to enforce adequate hygiene, but where this has been done hookworm infection has been largely controlled and severe anaemia is rare.

Trachoma continues to be a problem but a new treatment using a modified course of "Lederkyne" holds out some promise.

Active yaws is clinically rare although there is some evidence of late effects of earlier infection.

#### NURSING BRANCH

In her report, Appendix XVI, the Principal Matron, Miss Lee, comments on the improved position in the staffing of our hospitals, in that there are more experienced trained nurses and enrolled nursing aides available. It is expected that with the better conditions obtained in the new Nurses' Award the improvement will continue. This improvement is even extending to the hospitals in the North-West.

A considerable part of the time of the Nursing Branch is spent in the inspection of private hospitals and maternity homes. The increase in the number of "C" class hospitals continues. In all these cases the premises have to be inspected and approved before a licence is granted and this entails a considerable amount of responsible work on the part of Miss Lee and Miss Beard, the Assistant Principal Matron. Assistance is also obtained from the Health Inspectors of this Department.

The Government School of Nursing, in the charge of Miss E. Harler, Organizer of Nursing Training, continues to do good work.

#### NURSES' REGISTRATION BOARD

See Appendix XVII.

The Nurses' Registration Board made an important development in the course of the year. In May, Miss D. H. Bailey was appointed as Education Officer and the Board expects that her work will ensure improvements in the standard of training of nursing in the State in the future.

#### PHOTOGRAPHIC SECTION

Under the care of Mr. R. Plummer, Senior Medical Photographer, whose report is in Appendix XIX, this Section has developed considerably its routine work for the Department and certain hospitals in the Metropolitan Area, as well as for doctors in private practice. There was an overall increase of 33 per cent. of work during the year.

Mr. Plummer mentions certain interesting experimental work which was carried out with Dr. Lamb in the estimation of the radius of curvature of the cornea of the eye, as well as a topographical record of its contour. In addition, an apparatus for photographing the cervix of the uterus was developed and used at Fremantle Hospital.

#### OCCUPATIONAL HEALTH

The report of the Physician, Dr. Letham, appears in Appendix XVIII.

Dr. Letham has shown that there is more scope than had been previously anticipated for work in occupational health in this State. That this will increase is clear because of industrial developments in hand and anticipated in the near future.

The Silicosis Survey was almost completed and of the places of work visited and the employees examined (760), evidence of silicosis was found in 20, or 2.6 per cent.



In the course of the year the pilot survey of noise in industry was completed. Of the 437 employees who had audiometric examination, approximately one-third were fitted with ear plugs. The problem of noise in industry is of great importance and is to be pursued by this branch of the Department. We are grateful for the collaboration and assistance of the Commonwealth Acoustic Laboratory.

Further work has continued on grain dust and also on the use of phosphene for the storage of wheat in storage bins.

Dr. Letham is continuing his valuable work and it is pleasing to record the assistance and co-operation which he is receiving from other Government Departments.

### HOSPITAL MORBIDITY AND MORTALITY STATISTICS

These statistics (*see* Appendix XXI) are prepared from returns submitted for 1960 by the three major public hospitals and represent approximately one-third of the general hospital beds in the State. The returns submitted are coded according to the International Classification of Diseases.

The statistics indicate the use made of general hospital beds and the variations that appear from year to year give some appreciation of the altering trends in hospital practice. In this respect, the figures may be compared with similar tabulations for 1958 in the 1959 Annual Report.

It will be seen that 30 per cent. of persons discharged in 1960 were 60 years of age and over and they occupied 44 per cent. of the beds. The corresponding percentages in 1958 were 26 per cent. and 38 per cent. respectively.

Nearly half the total beds (49·01 per cent.) were occupied by cases for surgical operation, and accident cases claimed 21·35 per cent. of the total beds. Accidental falls and road traffic accidents form the major portion of accidents admitted, the former occupying 6·08 per cent. and the latter 8 per cent. of the total beds. More deaths in hospital were recorded from falls (41) than from road accidents (38). Although not shown on the breakdown of figures in the tabulations presented, a considerable part of the bed occupancy from falls can be attributed to old women and their fractured femurs. An indication of the peculiarity of falls and fractured femurs to old women can be obtained from Item 49 in the main table (N820-N829) where the average number of days in hospital for fractures of the lower limb in men is 35·4 days and in women, 51·5 days, and the average age of men with fractures of the lower limb is 39 years, whereas in women it is 60 years.

A separate table for operation cases is given, this is coded according to the Code of Surgical Operations, General Register Office. These cases are also included in the main table under the International Classification of Disease Code.

Tables show by sexes the number of persons discharged during the year 1960 in the various disease and operation groups, the length of time they were in hospital, and the average age of the persons in each group. Results of treatment are also indicated.

It should be mentioned that the tabulations given are merely an indication of the information being obtained from these hospitals and recorded on Hollerith cards. The cards are retained as a permanent record and can give a vast amount of detailed information beyond that which is at present recorded.

### LIBRARY

In his report, Appendix IX, the Librarian, Dr. J. F. Woolcott, gives an outline of the policy which is being pursued by this Section of the Public Health Department.

It will be seen that the ramifications of the Library service and its importance to the Department and allied organisations are such that the present accommodation is quite inadequate. It is expected that the library will be removed to larger premises next year.

### CONCLUSION

I wish to express my thanks to Dr. Davidson who deputised so ably for me during my absence on long service leave, and to the staff of the Department for their loyal co-operation. Finally, Sir, I would like to thank you for your continued encouragement and assistance throughout the year.

LINLEY HENZELL, M.D. (London, B.Sc., D.P.H.,  
Commissioner of Public Health.

# Appendix I

## VITAL STATISTICS FOR WESTERN AUSTRALIA

	1958	1959	1960
Mean Population—			
Males     ....     ....     ....     ....     ....     ....     ....     ....     ....	361,951	368,254	374,654
Females   ....     ....     ....     ....     ....     ....     ....     ....     ....	343,649	350,576	356,749
Total   ....     ....     ....     ....     ....     ....     ....     ....     ....	705,600	718,830	731,403
Births—			
Males     ....     ....     ....     ....     ....     ....     ....     ....     ....	8,532	8,726	8,699
Females   ....     ....     ....     ....     ....     ....     ....     ....     ....	8,199	8,385	8,227
Total   ....     ....     ....     ....     ....     ....     ....     ....     ....	16,731	17,111	16,926
Birth rate per 1,000 of Mean Population     ....     ....     ....     ....	23·71	23·80	23·14
Deaths—			
Males     ....     ....     ....     ....     ....     ....     ....     ....     ....	3,270	3,240	3,353
Females   ....     ....     ....     ....     ....     ....     ....     ....     ....	2,284	2,257	2,344
Total   ....     ....     ....     ....     ....     ....     ....     ....     ....	5,554	5,497	5,697
Death rate—rate per 1,000 of Mean Population     ....     ....     ....	7·87	7·65	7·79
Natural increase rate per 1,000 of Mean Population     ....     ....     ....	15·84	16·15	15·35
Infant Mortality per 1,000—			
Live Births :			
Metropolitan Area   ....     ....     ....     ....     ....     ....     ....	19·52	18·28	19·47
Rest of State       ....     ....     ....     ....     ....     ....     ....	23·61	22·16	23·89
Whole State     ....     ....     ....     ....     ....     ....     ....	21·52	20·16	21·62
Stillbirths :			
Metropolitan       ....     ....     ....     ....     ....     ....     ....	107	102	117
Whole State       ....     ....     ....     ....     ....     ....     ....	225	225	226

Comparison of Infant Mortality and General Death Rate

Place	Infant Mortality			General Death Rate		
	1958	1959	1960	1958	1959	1960
New Zealand (a)     ....     ....     ....     ....	19·40	19·89	19·66	8·90	9·09	8·81
Western Australia   ....     ....     ....     ....	21·52	20·16	21·62	7·87	7·65	7·79
New South Wales     ....     ....     ....     ....	21·29	22·65	21·16	8·76	9·38	9·15
Victoria           ....     ....     ....     ....	19·23	21·21	18·46	8·62	8·92	8·49
Queensland         ....     ....     ....     ....	19·40	20·25	21·01	8·10	8·59	8·48
Tasmania           ....     ....     ....     ....	19·49	23·42	19·09	8·02	8·07	7·62
South Australia     ....     ....     ....     ....	22·40	20·71	18·94	8·63	8·62	8·26

(a) Non-Maori.



## Appendix II

### PUBLIC HEALTH LABORATORIES

*To the Commissioner of Public Health, Western Australia*

#### 1.—ADMINISTRATION

##### *General*

The peculiar problems facing this laboratory service were adequately discussed in the 1959 annual report : these problems are to provide a satisfactory Public Health Laboratory service and at the same time to provide a hospital and out-patient laboratory service, excluding private patients, for the whole of the State with the exception of four teaching hospitals sited in the Metropolitan area. This dual responsibility is rendered much more difficult by the great distances which are such as to render it impossible to provide an adequate laboratory service operating in one area only. As also was explained in the 1959 report the solution decided upon was to place branch laboratories in all centres of population of appreciable size, the functions of these branch laboratories being limited to investigations requiring immediate action, with the shunting back of other material to the central laboratories. This system is now being implemented as detailed below. It may be of interest to note that the total hospital beds for which we are responsible reaches the impressive figure of over 5,000 including the Mental Health Service hospitals : this total is several times larger than any other in the State and is probably one of the largest laboratory responsibilities in Australia.

##### *Branch Laboratories*

Branch laboratories are now functioning as follows :—

To the North.—Derby in the far north serving also Broome and Wyndham ; Geraldton, serving Geraldton itself and the hinterland ; Northam, serving the wheat belt area as far as possible ; Wooroloo, serving a 200 bed hospital.

To the South.—Bunbury with its sub-branches at Collie and Busselton ; Albany, serving Albany itself and the neighbouring smaller hospitals.

This is only a beginning : the problems still are—

- (1) To the North.—With the opening-up of the North-West much more will have to be done, probably with Derby as an expanded centre with sub-branches at Wyndham and Broome : also the Onslow, Roebourne, Port Hedland, Wittenoom Gorge area will require further help in the future.
- (2) To the South.—Staff and equipment have been planned for Narrogin Hospital, and the Manjimup area is under review. This leaves still the problem of Esperance and a problem in the south-west corner.
- (3) To the East.—We have only the Goldfields area to consider and are fortunate in that the Commonwealth Health Department provides a laboratory service for that area. It is hoped within the near future to establish a working partnership with the Commonwealth Laboratory provided administrative approval is forthcoming.

The greatest problem of the branch laboratories is ensuring that the standard of work carried out in such laboratories reaches the same standards as in the central laboratory. In laboratory work a false answer is worse than no answer. Necessarily therefore a heavy burden is placed on the branch laboratories' staff who are expected to provide a high standard of work in several different branches of medical technology each of which is served by specialised staffs in large laboratories. Consequently the men in charge of the branch laboratories are individuals of wide experience and of a high standard of honesty rendering important service to the community. These men are expected to hold themselves available for duty 24 hours a day seven days weekly. To help maintain these high standards the branch laboratories are supplied each week with "unknown" samples previously tested at the central laboratories. The results of the examination of such "unknowns" indicate immediately if a fault has developed in any of the equipment at the branch laboratories. It should here be noted that the central laboratories voluntarily submit themselves also to such periodic tests of efficiency the checks being carried out by the Australian College of Pathologists and the American College of Pathologists.

##### *Accommodation*

With the exception of the virology section in Murray Street, Perth, and the animal breeding station at Shenton Park Hospital, Perth, the central laboratories are sited in Perth Chest Hospital and serve also as that hospital's laboratories. In spite of all possible help given by the Physician Superintendent, Perth Chest Hospital, the accommodation is inadequate. Steps taken to meet this problem include—



- (1) Immediately.—Available help : permission has been asked for the taking over of the old poliomyelitis vaccination centre in Stirling Street, Perth, and discussions have begun with the Repatriation Department in an attempt to obtain a little space in the neighbouring Hollywood Repatriation Hospital.
- (2) *Mid-term Action*.—A scheme has been put forward for the great expansion of the sheltered workshops of the Mental Health Services the intention being that they take over as much as possible of the washing-up and preparation of glassware, etc. : this is discussed more fully below.
- (3) *Long-term Proposals*.—While no firm discussions have taken place on this problem it is obvious that soon plans will have to be considered for the expansion of the central laboratories.

### *Equipment*

The laboratory service remains very well equipped except that there has been some delay in the supplying of the safety hoods. A second incubator room is on order from the Public Works Department. The first incubator room has proved very satisfactory.

### *Claremont Workshops*

In the 1959 report reference was made to the great help rendered by the Mental Health Services in taking over much of the important cleaning and preparation of laboratory glassware and equipment. In 1960 it was decided to expand this scheme. Such an expansion will greatly relieve us and, it is hoped, will provide interesting and remunerative work for the mentally sick. There has been a long delay in the drawing-up of plans for a new workshop at Claremont but it is hoped that this delay will not continue indefinitely.

### *Tours and Conferences*

Probably the most important duty of the Director of these laboratories is to maintain a close liaison with the workers in the branch laboratories, and this can only be done by frequent visits. Unfortunately these visits were too infrequent in 1960 a fault which will be remedied in 1961. The Chief Technologist was able partly to fill this gap by touring some of the laboratories, particularly those in the North.

In 1960 the Director was able to visit the major laboratories in all other States in Australia on his way to and from conferences in Sydney and Melbourne. The impression gained from this extensive tour was that of an extremely high standard of laboratory work throughout Australia, with individual workers about as good as could be found anywhere. The Brisbane Institute of Forensic Pathology proved particularly impressive.

During 1960 also the sterling importance of Dr. Kovacs' work on mycobacteria was recognised by his being asked to attend and address the Vienna congress. This recognition was underlined shortly afterwards by a similar invitation being extended to Dr. Kovacs to lecture at the 1961 conference of the Bacteriological Society of Germany.

In December Dr. Kovacs also attended a Waters Department conference in Melbourne and a Commonwealth Tuberculosis Laboratory conference in Canberra : this second conference had been called at our request to attempt to bring some standardisation into the laboratory investigation of tuberculosis and the new chest diseases : at that Canberra conference Dr. Kovacs was elected as one of three workers on a special techniques sub-committee. The aim of the Melbourne conference on waters was also an attempt to investigate methods of standardising water investigations and water standards throughout Australia.

In August, 1960, the Chief Technologist, Mr. Drummond, and Senior Technician, Mr. Neal, attended the triennial conference of the Australian Institute of Medical Laboratory Technology. At that conference a well-deserved tribute was paid to Mr. Drummond by his being elected President of the Institute and Mr. Neal was elected treasurer.

### *Handbook*

In 1960 a laboratory handbook was completed and issued to all hospitals and to individual medical practitioners.

### *Working Hours*

Illness is no respecter of persons or of the clock. It is impossible to operate a large laboratory service within the usual working times of an office or factory. Hitherto the after-hours needs of the hospitals and of the outside hospitals have been met by the working of much overtime and by a system of having staff sleep in the hospital. This is not a good thing as the staff work long hours and the cost to the community is heavy. Beginning in 1961 it is hoped to work a system of staggered duties which will allow of a laboratory service from 8 a.m. daily to 10 p.m. daily including Saturdays and Sundays, with the remaining interval of time covered by a worker actually resident in hospital. Not only will this provide a better and cheaper service but in fact it will increase the size of the laboratory by spreading the work over a longer period each day.



2.—STAFF

1. General

The expansion of work in the central laboratories and the opening-up of new branch laboratories necessitated recruitment of fully trained staff from overseas, in addition to obtaining of a small number of recruits locally from Western Australian sources. The supply of local recruits in 1960 was offset by an equal number of moves from this laboratory service to other laboratories in the State, the moves resembling a game of musical chairs.

The recruitment from overseas will continue in 1961 but it is hoped that by 1962 the need will cease for overseas recruitment as by that time there will begin a flow of trained men from the numbers of young men now under training in this service. The training given to these men is the one suggested by the Australian Institute of Medical Laboratory Technology and it could not be bettered anywhere. It is long and expensive and there is a regrettably high falling by the wayside. It has been our experience that beginning in 1960 the numbers of young men and women offering themselves as trainees have substantially increased over previous years and the standard of recruits is very high. In our view the danger in the future will not be one of shortage of Technologists : there is real danger of over-many individuals qualifying but this is unlikely for some years to come.

The question of wastage of trainees is a worrying one and undoubtedly related to the demands upon the trainee : he is expected to carry out a day's work and to attend training classes mainly in his own time which may mean three to four nights weekly at technical classes. He is well paid for his work in the laboratories and it is to his advantage to attend the evening classes without which he cannot qualify in medical technology but it is possible that by lowering the salaries of trainees and allowing them to attend classes two working days weekly there might be less wastage among recruits. This last system is being tried in other technology departments and in South Africa has been carried to the stage whereby the individual spends his first two years at school and is paid as a member of the staff.

Posts						Resignations	Recruitments	Promotions	Remarks
Senior Technologists	....	....	....	....	....	1	6	....	To Senior Technologist
Technologists	....	....	....	....	....	4	3	2	
Laboratory Assistants	....	....	....	....	....	2	6	....	
Clerical Workers	....	....	....	....	....	5	5	....	To Office
Attendants	....	....	....	....	....	4	10	1	
Others	....	....	....	....	....	3	4	....	

2. Health of the Staff

Considering the significant element of risk in laboratory work it is pleasant to record that the health of the staff remained highly satisfactory during 1960, better even than several other Government departments whose workers are not directly exposed.

While on leave in the Eastern States Miss Jenkyn suffered severe injuries in a motor accident in January. She resumed in March.

3. Pathologists

The laboratory services have been most fortunate in the recruitment of Dr. Stirrat, previously Professor of Pathology, University of Alberta, Canada. Dr. Stirrat is both a pathologist and a virologist and will take over the virology department and histopathology department on his arrival in the State. During the months of December 1960 and January 1961 he will tour the United Kingdom laboratories to investigate recent advances in virology investigation and research.

The arrival of Dr. Stirrat will bring the total central pathologists strength to three plus one trainee pathologist which is too low a figure for the size of the service and leaves no adequate protection against sickness or other emergencies.

3.—WORK DONE IN 1960

1. General

As stated in the 1959 annual report, with the exception of the virology department the work done for the year is reported not only in terms of total tests carried out but also in terms of the much more realistic method of unit values : this system of unit valuation of work done has not yet been applied to the virology department but this will be rectified in 1961.

Table III 1 (appendix) gives a general summary of the work done during the year : it shows an increase of 45% compared with 1959.

Brief notes are given below of certain of the more interesting and more important findings during 1960. The notes are taken both from the public health section and from the hospital laboratory section of the work since it is not possible to divorce one from the other.



## 2. Microbiology

### A. General

In the past the general microbiology department and its sub-sections have suffered from the wide variety of problems they were called upon to handle, ranging from public health problems of water and sewage analysis to purely clinical problems such as the culture of serous effusions. The department included such diverse sections as mycology, Salmonella investigation work etc. A start was made of simplifying the work by separating off the Salmonella and Shigella investigation as a separate sub-section and arrangements similarly were made to separate off the work of the mycology section in 1961. In Table III 2 A 1 (appendix) a survey is made of the more important work of the general microbiology section in 1960.

(a) *Diphtheria*.—Diphtheria is an ever-present possibility in this State, and 1960 proved no exception: in all 15 individuals were found to be harbouring *Corynebacterium diphtheriae* (13 *mitis* and 2 *gravis* types). Only one strain was found to be virulent.

(b) *Bowel Infection*.—Discussed separately under “*Salmonellae*”, below.

(c) *Sewage Testing*.—In the 1959 report reference was made to the fact that when certain adverse conditions operated together, e.g., peakload and on-shore wind, the chlorination treatment of the sewage effluent was insufficient to control fouling of certain Metropolitan beaches. In November, 1960, the outlet pipe was extended well into deep water and since then there have been no recordings of occasional high counts previously reported from the beach areas.

(d) *Water Testing*.—The great majority of workers are in agreement that the present system of testing water for potability is an unsatisfactory one but no one has yet produced a satisfactory alternative. The conference in Melbourne in 1960 did not recommend any striking differences in the present techniques. Any new method would have the serious disadvantage of having no base-line such as exists for the present methods.

(e) *Hospital Infection*.—It is estimated that at any one time 4% of the hospital beds in England are occupied by individuals who have developed a hospital infection, usually due to a *Staphylococcus*. The problem of the control of hospital infection is an extremely difficult one. It is realised that there are reservoirs of infection everywhere, in the staff, among the patients, in the patients' beds, and on the ward floor and furnishings. Throughout the year methods aimed at control have been investigated, e.g., use of disposable masks or expensive fibreglass masks, slit sampling of air in different areas of the hospital, investigation of the feasibility of using ethylene oxide gas as a sterilising agent. etc. Since the hands of the patient and those of his attendants are among the most important vehicles of transport of infection investigations have continued into the problems of sterilising those important instruments. Compounds tested include 70% alcohol, iodine + alcohol, and six different proprietary preparations singly and in various combinations. Our findings again confirm that the most effective methods of sterilising the hands lie, not in expensive proprietary preparations, but simply in the use of 70% alcohol. This, however, tends to have a drying effect on the hands which was found to be overcome by the addition of 2% amphyl, a proprietary preparation.

*Hospital Staphylococcus*.—This is the most important of the organisms causing hospital infection.

A nasal swab survey carried out in Perth Chest Hospital in 1960 showed that of the 1,050 nasal swabs examined “hospital” *Staphylococci* were found in 2.5% of individuals tested. This “hospital” *Staphylococcus* is sensitive only to Chloramphenicol, Erythromycin and Bacitracin.

As part of attempts to keep down the incidence of staphylococcal infections hospitals were encouraged to send *B. stearothermophilus* test strips for culture after autoclaving. During the year 48 such specimens were received, 12 being from country hospitals: these 48 test strips showed no growth.

In the fight against hospital infection it had been hoped to form two *ad hoc* committees in 1960, one to help plan a central sterilising service for old and new hospitals and the other to investigate all the various facets of the problem of hospital infection. So far it has not been found possible to bring these committees into operation.

(f) *Drug Testing*.—One of the most important parts of the work of the general microbiology laboratories is the testing of organisms against the more commonly used antibiotics. Due to the high cost of commercial antibiotic discs it was decided to prepare sensitivity rods as explained in the 1959 annual report. Much difficulty was experienced until it was discovered that the absorbing of the rods with antibiotics must be carried out at a pH of 8.0. Eleven antibiotics now form the standard test pattern in such work.

The testing of new chemotherapeutic agents is an important part of this work and during 1960 the newer preparations Furoxone and Furadantin were tested. The findings are summarised in Table II 2 A 2 in the appendix.

During the year 69 strains of *Diplococcus pneumoniae* were isolated, predominantly from sputa and it was found on antibiotic testing that 32 of these were resistant to Streptomycin. Also, during the year 76 strains of *Streptococcus haemolyticus* were isolated. By the use of Taxos A discs and the modified plate method of Ward and Rudd (1955 report) 52% were found to be Group A. These 76 strains were nearly all sensitive to Penicillin, Tetracycline, Chloramphenicol, Erythromycin and Bacitracin but exactly 50% of them were resistant to Streptomycin: this resistance was more common among Group A strains.

This being a Chest hospital with many patients receiving Streptomycin therapy for long periods it became necessary to find a method for the estimation of Streptomycin blood levels. The method finally adopted was that introduced first by Middlebrook and his co-workers: this method is easy but takes a minimum of three days to complete.



Milk was another fluid on which it was necessary to carry out estimations of drug content during the year under review. The drug in question was Penicillin and the aim was to assess whether the widespread use of Penicillin in the dairy industry is affecting the milk supply. The method used in this investigation was the plate method of Treffers which is sensitive to 0·1 units of Penicillin. A total of 86 bottles of pasteurised milk were tested and were all found to have no detectable content of Penicillin.

(g) *New Techniques.—Sputum Washing.*—Among the newer techniques found most profitable during the year was the method of washing of sputa : by this treatment the resultant culture from the specimen is likely to show a high preponderance of the organism causing chest disease in the individual providing the specimen : the technique consists of shaking the sputum in a sterile bottle containing 100 mls. isotonic saline and 8 glass beads. This breaks the sputum into small pieces and seems to wash off from these small pieces all contaminating organisms acquired during the passage of the material up the respiratory tract. Small pieces of sputum are then pipetted into one ml. infusion broth, mixed with a sterile loop, and inoculated on media.

One significant drawback to the above methods is that any sputum may contain tubercle bacilli unknown to the laboratory staff. Therefore, during this work special non-permeable fibre-glass masks are worn and the process is carried out inside a safety hood.

## B. Mycology

The mycology department was brought into being in late 1960. At first the number of specimens submitted for examination was not great presumably because the medical profession of the State were not aware of the availability of this service : there is being prepared a short note on the functions and scope of the laboratory with details on the methods of despatch of specimen for examination and this note will be issued as a supplement to the new handbook. This service is considered essential as Western Australia, with its wide range of climatic conditions, has many areas conducive to fungal disease especially the areas to the North and West so much so that even in the absence of any specific request all sputa, ear swabs, and cervical smears are routinely examined for fungi. From ear swabs the main pathogen recovered has been *Aspergillus niger* : the examination of cervical smears has also been of use as repeatedly it has been possible to identify a fungus as the cause of an obscure discharge which had been thought to be due to a much more grave condition.

From sputa the main fungi isolated were species of *Candida*, *Aspergillus*, *Penicillium*, and various *Mucoraceae* : such fungi are not amenable to treatment by the more common antibiotics and their persistent presence even as saprophytes may serve to warn the clinician of the danger of pressing treatment with an antibiotic which is serving no purpose and which may allow the fungus to run riot and become established : this problem of the significance of the fungus in a sputum necessarily is one for the clinician to solve, and it is difficult. The fungi are true fifth-columnists implanting themselves as lodgers on diseased tissue and masquerading as harmless saprophytes when carefully watched but capable at any time of showing their true colours by becoming pathogenic and then invading their host, and possibly even killing him : four such cases were seen in 1960.

Similarly, in skin conditions dermatophytes should always be considered as possible causes : pathogens isolated from skin scrapings in 1960 included *Trichophyton mentagrophytes*, *T. verrucosum*, and *Microsporum gypseum*.

## C. Salmonella Investigation Unit

The Salmonella Investigation Unit began to function fully in early 1960 since which time a total of 1,978 specimens has been examined : the findings from these specimens were 175 *Salmonella* isolations and 19 *Shigella* isolations : Tables III 2 C 1 and III 2 C 2 Appendix give details of the specimens and the recoveries. As has been said before there is no doubt that the above isolations represent only a tiny fraction of infections occurring in the State. We may again quote the view of the World Health Organization that "no country in the world can be said to possess now either a reasonable picture of the occurrence of *Salmonellosis* within its borders or an organization which has brought it under control."

1. *Salmonella Isolation.*—One important part of the work of the Salmonella unit is the production of *Salmonella* antisera to allow of the quick identification of organisms isolated in this laboratory or in other laboratories which seek our help. To date 27 sera have been produced.

One other important function of the Salmonella Unit is to conduct investigations into the relative merits and efficiency of standard methods of investigation at present being used.

On the clinical side of the work possibly the most interesting case was one in which a patient was found to be excreting *Salmonella cholerae-suis* in his sputum and from a fistula in his chest wall. This patient is still excreting this organism several months after our first isolation of it. This is one more example of how necessary it is to realise that the carrier state in salmonellosis is more common than had hitherto been realised.

Like other sections of the central laboratories the Salmonella Unit serves the public at large as well as each individual and the work of the unit is particularly important in respect of public health duties, i.e., the checking of food-stuffs and food handling and the checking of egg pulp for export. Table III 2 C 1 (appendix) shows the details of specimens examined and Table III 2 C 2 shows the *Salmonella* serotypes isolated. Recent publications in England show that the *Salmonella* serotypes recovered from cocoanut by English workers agree closely with the serotypes recovered by this laboratory from cocoanut shipments from the same sources. Surprisingly, although the English workers found *Salmonella perth* very commonly in their infected cocoanut this was one serotype not identified by us ! The most disturbing feature of the cocoanut investigations was the recovery of *S. paratyphi B* from two samples.



In addition to the testing of egg pulp for export, batches of kangaroo meat were tested for bacterial contamination and the results compared with fresh beef, mutton, and pork, and with beef, mutton, and pork which had been stored in a cold room for 10 days. Both the freshly killed and the frozen beef, mutton, and pork were of high quality showing low bacterial counts and no enterococci, no faecal B. coli, and no Salmonellae, whereas the frozen kangaroo samples, three in number, were heavily contaminated with pathogenic organisms, viz. :—

Kangaroo Meat	Total Bacterial Count		Enterococci	Faecal Coli	Salmonella Isolations
	37° C.	22° C.			
Sample I ....	46,800	45,000	MPN per g. 1800+	MPN per g. 550+	+
II ....	350,000	76,000	1800+	1800+	+
III ....	400,000	5,000	1800+	1800+	+

The kangaroo meat did not meet the standard set by the American Public Health Department for frozen foods. In view of these findings it may be advisable to test certain other frozen foods both for export and for human consumption.

2. *Shigella Isolations*.—Of the 19 *Shigella* strains isolated during the year, 10 proved to be *Shigella flexneri* type 2, eight *Shigella sonnei*, and one *Shigella flexneri* type 6. The following table indicates the sensitivity results obtained (one strain only being taken from related outbreaks) :—

Shigella Strain	Total	Total of Strains Sensitive										
		Penicillin 10 units	Streptomycin	Chlorotetracycline	Oxytetracycline	Tetracycline	Chloramphenicol	Polymyxin B.	Erythromycin	Bacitracin	Sulphadiazine	Furadantin
Shig. flexneri type 2 ....	7	0	4	6	6	6	6	7	0	0	1	7
Shig. flexneri type 6 ....	1	0	1	1	1	1	1	1	0	0	1	1
Shigella sonnei ....	7	0	7	7	7	7	7	7	0	0	1	7

All faeces reaching the Salmonella unit for investigation for bowel pathogens are examined for ova cysts and any helminths. This is likely to be an increasingly important part of the work with the opening-up of the North-West, where undoubtedly there is much helminthic disease.

D. *Tuberculosis and Pseudo-tuberculosis*

Here the term “ Pseudo-tuberculosis ” is used to mean lung disease caused by the new “ anonymous ” mycobacteria. This term is not a good one as there is no relationship between the two diseases, but no other term is as yet generally acceptable. Table III 2D1 (Appendix) gives a general summary of the investigations carried out in the tuberculosis laboratories in 1960.

Mycobacteria were isolated from 299 individuals in 1960. A summary of the findings is :—

—	Mycobacteria tuberculosis	Anonymous Mycobacteria		
		Group II	Group III	Group IV
Repeat, known positive before 1960 ....	30	....	22	1
First isolated in 1960 ....	150	9	72	15
Totals ...	180	9	94	16

1. *Tuberculosis*.—It is claimed that in the world at large tuberculosis is still the number one killer of mankind. Australia’s remarkable advances in the control of this dread disease are due in great measure to an unremitting search as with X-ray surveys for unsuspected disseminators of the causative organism. However, suspicious findings, whether clinical or radiographic, are not sufficient. The final proof lies in the laboratory identification of the organism in the sputum of the patient. Similarly, the laboratory must act as policemen in the testing of individuals who have been discharged from hospital for domiciliary treatment after sterilisation of the sputum by the newer chemotherapeutic agents. But the finding of the tubercle bacillus is often technically difficult. Generally speaking in the sputum of the infected individual it is greatly outnumbered by other organisms which on ordinary growth media outstrip and smother the slow-



growing tubercle bacillus. The first aim therefore in the search for this organism is to kill the normal flora of the sputum yet leave the tubercle bacillus alive. This is a matter of balance and by the methods in use there seems no doubt that in killing the other organisms we kill 99 per cent. of the tubercle bacilli and are left with the problem of encouraging the surviving 1 per cent. to grow on special media. The net result of course is that a whole battery of growth media must be used to catch elusive survivors of the initial treatment. The whole process is expensive, and justified only by the much greater cost of missing an individual capable of infecting others. The constant endeavour of all tuberculosis laboratories is to keep the cost of investigation as low as possible consistent with the cost of missing a positive patient. In this laboratory, as in so many others, the standard pattern of investigation is to attempt to grow the organism on several old and tried media and at the same time run small pilot experiments always with the hope of reducing the number of media or greatly quickening the growth times of the organism. Until very recently growth on standard media took up to eight weeks but recent work gives hope that this long period of waiting will be reduced to less than half that time by the use of new types of growth media.

COMPARISON OF EFFICACY OF THREE MEDIA, viz., LOWENSTEIN-JENSEN, KIRCHNER, AND BLOOD MEDIA  
(Based on a random sample of 400 strains of *M. tuberculosis* and 200 strains of atypical mycobacteria of all groups.  
Note : L-Jensen = Lowenstein-Jensen medium.)

% All Media positive	% Kirchner +ve. Others negative	% Kirchner —ve Others positive	% L-Jensen +ve Others negative	% L-Jensen —ve Others positive	% Blood med. +ve Others negative	% Blood med. —ve Others positive	% Contaminations		
							Kirchner	L-Jensen	Blood
M. tuberculosis— 40    ....    ....	8	1	1	31	9	10	} 9.4	7.4	7.2
Atypical mycobac- teria— 19    ....    ....	29	1	8	32.5	8	2.5			

In view of the obviously unsatisfactory results with Lowenstein-Jensen medium this was abandoned towards the end of the year and its place in the routine battery of media was taken by Gottsacker medium which, to date, has proved very suitable for the Atypical mycobacteria.

As shown in Table III—2D1 (Appendix) 9,887 cultures were carried out and of them 744 (7.5 per cent.) showed *Mycobacterium tuberculosis*. These 744 positive specimens originated from 189 patients. As in 1959 the standard media were Kirchner medium Loewenstein-Jensen medium, and Blood medium (see pre-page).

2. *Pseudo-tuberculosis*.—This term seems at present to be the least objectionable method of referring to lung disease caused by new so-called “atypical” or “anonymous” mycobacteria. It is necessary here again to stress that phthisis and pseudo-tuberculosis cannot be distinguished except in the laboratory : clinically, radiologically and from the viewpoint of histopathology the two types of disease present the same picture.

Dr. Kovacs of this Department is acknowledged as a leading authority on this problem of the laboratory diagnosis of pseudo-tuberculosis and, in his absence in Europe (kindly financed by the Women’s Auxiliary of the Tuberculosis Association of Western Australia) the following notes are culled from his records.

Under the present provisional classification the anonymous mycobacteria are divided into four groups : I, II, III, and IV. Groups I and III are often found to cause disease in man. Only Group III disease is seen in Australia where Group I has not been recovered from any individual. Groups II and IV are saprophytic rarely causing disease but often found as lodgers on diseased tissue. Indeed Group III itself also often appears either as a lodger or masquerading as a lodger.

As seen from Table III—2D1 (Appendix), of the 1,079 cultures found positive for mycobacteria in 1961, 31 per cent. of the cultures proved to be anonymous mycobacteria. These 332 positive cultures were obtained from 119 individuals as shown in paragraph one of this section : in 25 of the 119 individuals the mycobacteria were saprophytic Groups II and IV and of no importance, leaving the large total of 94 individuals harbouring Group III though not of course necessarily suffering from disease due to that organism since Group III like the fungi has a dual role sometimes appearing as a saprophyte and sometimes appearing as a true pathogen. The Western Australian series of individuals harbouring Group III anonymous mycobacteria, the so-called “Battey” organism, is one of the biggest on record and is increasing at an alarming rate : Table A below gives a picture of the rate of increase of the organism over the last five years.

As has been said, the identification of Group III and other “anonymous” mycobacteria can only be made in the laboratory, and only with certainty in a laboratory with special experience in this work. Like so much other work in microbiology the identity of the organism is established from the results of a whole spectrum of tests, e.g., growth characteristics, biochemical reactions, and pathogenicity for laboratory animals. Here it must again be stressed that, like the fungi, “Battey” type organisms may appear in sputum and other body excreta as saprophytes : their presence may only be taken as indicative of true pathogenicity provided they satisfy Koch’s postulates, and this is the responsibility of the clinician as well as the bacteriologist.



NUMBER OF ATYPICAL STRAINS ISOLATED FROM 177 PERSONS  
(Group III :—134 Persons)

Specimen	1955-1956			1957-1958			1959-60-61 (1.3.61)			Total
	Group			Group			Group			
	II	III	IV	II	III	IV	II	III	IV	
Sputum ....	....	....	18	3	13	2	28	392	17	473
Bronchial Lavage ....	....	....	....	....	....	....	....	12	1	13
Laryngeal Swabs ....	....	....	....	....	....	....	....	2	....	2
Gastric Content ....	....	1	26	2	1	8	4	22	3	67
Pus ....	....	....	....	....	1	....	....	2	....	3
Urine ....	....	....	4	....	....	....	1	5	1	11
Resected Lung Tissue ....	....	....	....	....	....	....	....	3	....	3
Lung Tissue taken at P.M. ....	....	....	....	....	....	....	....	8	....	8
Faeces ....	....	....	....	....	....	....	....	1	....	1
Pleural Fluid ....	....	....	....	....	....	....	....	1	....	1
Cervical Gland ....	....	....	....	....	....	....	....	1	....	1
Total ....	....	1	48	5	15	10	33	449	22	....
Grand Total ....	49			30			504			583 (Gr. III : 465)

From certain resemblances in biochemical reactions etc. it has been suggested that the Group III “ Battey ” mycobacteria may be related to the mycobacterium causing avian tuberculosis, and this has led to much speculation and premature hypotheses : great caution should be exercised in drawing any conclusions from a few resemblances especially when it is remembered that there are as many points of difference as there are points of resemblance between avian strains and Battey strains of mycobacteria, and when it is remembered that avian tuberculosis is unknown in Western Australia.

Not only do the anonymous mycobacteria differ from the true tubercle bacillus in some growth and other characteristics : they differ in one other and remarkable way, namely, mode of infection. True phthisis is a contact disease practically always acquired from an infected individual who is excreting tubercle bacilli in his sputum but this is not so with “ Battey ” type disease : although the numbers of individuals now found to show this new disease run into hundreds there has never been reported a case of human-to-human infection. The source of the infection and its mode of spread is as yet unknown. With this in mind Dr. Kovacs has searched for the Battey organism in much and varied material : his results are tabulated below, see Table B.

UNCLASSIFIED MYCOBACTERIA CULTURED FROM DIFFERENT SOURCES  
(excluding human material)

Specimen	Number of Examinations	Group II	Group III	Group IV	Total
Pig Glands ....	412	....	73 (17·7%)	4	73
Milk ....	331	....	14 (4·2%)	5	19
Soil ....	61	1	2 (3·3%)	22	25
Dust ....	10	....	3 (30%)	....	3
Wild Birds ....	238	....	....	3	3
Cattle Glands ....	284	....	2 (0·7%)	....	2
Sheep Glands ....	78	....	....	....	....
Commercial Egg Pulp ....	134	....	....	....	....

Growth at 22° C., 37° C. and 44·5° C.

It will be seen from Table B that of all the material examined in significant quantity the Battey organism was found only consistently and in large numbers in pigs (18 per cent. of 412 lymph glands) : this may prove to be an extremely important finding but its significance is not yet clear. All that can be said at present of the source of the new Battey disease is the old Biblical description of the wind : “ It bloweth where it listeth . . . thou canst not tell whence it cometh and whither it goeth ”. (*John*, III, v. 8.)



## E. *Virology Laboratories*

These laboratories are still sited in Perth City some miles from the central laboratories which is most unfortunate as it has prevented that close combination of the serology and virology sections without which it is not possible to obtain the fullest value from either section. Such a combination of endeavour is particularly important from the viewpoint of investigation of individual patients : it is a slow business to grow and identify a virus, so much so that the result may interest the clinician only in retrospect. Further, with the exception of a few viruses which are obligate pathogens on man, the finding of a virus in excreta of a patient may be of doubtful significance since many viruses, like the fungi and the pneumococcus, are capable of functioning sometimes as saprophytes and sometimes as pathogens. Compared with the results of attempts to recover viruses from excreta, much quicker and more informative results may be obtained from the serology examination of paired sera, i.e., from the examination of two samples of a patient's blood, one sample taken early in the disease and another taken two-three weeks later. If a virus is present in the individual and is causing the disease under investigation then certain blood changes will mirror this and these blood changes can be detected quickly and accurately in the serology laboratories. This is not sufficiently appreciated by those who seek our help since material submitted for examination much too often consists only of excreta from the patient : in 1961 it is proposed routinely to ask all medical practitioners to submit paired sera from all patients under examination for virus infections and it is further proposed to send out interim reports to each practitioner as is done by the tuberculosis laboratories.

The Appendix Tables III—2E1 and III—2E2 give details of the work done and the results obtained in the virology section during 1960 : it will be seen that although much work was done (21,000 examinations) only 21 viruses were isolated during the year and of these 21 viruses several probably were not pathogenic.

The trachoma section of the work is considered under "Research" Section III, 7, below.

## 3. *Biochemistry*

It cannot be said too often that while thirty years ago it was the melancholy duty of the pathologist to establish why a patient had died, it is now his duty to establish why a patient should not die. Much of this great difference in assistance to the clinician and to the patient is the result of advances in knowledge of the physiology and pathology of human biochemistry : this branch of laboratory work has emerged from the basement it occupied 30 years ago to take its place as a major section of clinical work and to overshadow much of the older laboratory disciplines in its complexity, its range and its importance.

The work done in 1960 by the Biochemistry laboratories is analysed in Table III 3 appendix. In the 1959 Annual Report reference was made to the necessity for standardising biochemical investigation throughout all the State laboratories. This was done in 1959. Methods in use are constantly under review, being changed whenever necessary, e.g., the methods for estimating transaminase, bilirubin, steroid hormone assays were changed in 1960 to conform with improvements in techniques. This standardisation of techniques not only ensures ready detection of errors in the routine "unknown" samples sent out to the branch laboratories but also allows of all reagents being made in the central laboratories thus relieving the branch laboratories of a burdensome task. This making of standard solutions is not reflected in the report of the work done for the year but should be kept in mind as a heavy load on the central laboratory biochemistry department.

In the biochemistry department in 1960 research was not only devoted to improved older methods of investigation but also included testing of new techniques required by other Departments of the State Government (e.g., the Occupational Health Branch) and required by other sections of the central laboratories, e.g., haematology and tuberculosis departments. Some of these new techniques have proved so valuable that we carry out this work for other laboratories : one such example is the analysis of blood levels of para-amino-salicylic acid.

During the year the battery of liver function tests was expanded : the continued demand by the clinicians for this battery of tests suggests that they are found of value and certainly wherever we have been able to compare laboratory and clinical findings as in prolonged follow-up of viral hepatitis patients, the laboratory tests and the clinical assessment of the patient ran a close parallel.

The biochemistry department's responsibilities extend beyond the investigation of the individual patient. Towards the latter half of the year several types of investigations were undertaken to assist in the control of industrial hazards. Especially important among these were the urinary coproporphyrin estimations on lead workers and cholinesterase activity estimation on persons handling organic phosphorous insecticides. The use of these insecticides is widespread through the State and as soon as possible the central laboratory techniques to detect their effects will be issued to the branch laboratories for the safeguarding of all workers at risk.

The biochemistry section is well equipped : it is not considered essential yet to recommend the purchase of auto-analysers now being adopted so widely throughout Australia. The greatest needs of the biochemistry laboratories are space and staff, not equipment. Space is seriously inadequate and the question of extra staff will have to be considered in the near future.

## 4. *Haematology*

The 1960 work of the haematology department is summarised in Table III 4 appendix. As with the biochemistry department an important duty of the haematology department, reflected in "other work", is to help maintain high standards in the branch laboratories by the sending out of routine "unknown" and other reference materials. This service is available to anyone who wishes to use it and in fact certain medical practitioners through the State now are sent test material of known values at frequent intervals to enable them to maintain a check on the accuracy of certain laboratory procedures which they must carry



out until the State laboratory help becomes more readily available to them. The present system of "haematology at a distance" is one whereby all that can be done is for the practitioner to send blood slides and samples of blood to the nearest laboratory. This is unsatisfactory in many respects : the nearer the laboratory gets to the patient the more satisfactory are the results for all concerned. A case in point is the question of examinations of blood films for malaria. Requests for such examinations from Government Departments and medical practitioners are all too often accompanied by one thin blood slide. The findings of such an examination mean nothing when negative : in any person suspected of malaria it is essential to let the laboratory have both thick and thin blood films taken every four hours for 24 hours : even then the disease may be missed in a positive case.

Among the most interesting findings in the haematology department during the year was the confirmation of severe iron-deficiency among many aborigines : parallel examinations of stool specimens has shown that these anaemias are due to heavy infestation with hookworm. Surprisingly this same problem was found to exist in quite marked fashion in some patients in mental hospitals. This latter investigation was part of much increased laboratory help now being given to the great hospitals of our sister service, the mental health authorities. Mental sickness unfortunately confers no immunity to physical sickness and indeed makes its detection more difficult and makes the necessary laboratory investigations even more important, as in diabetes. In fact some mental sickness has its roots in curable physical disease as in the recently-described megaloblastic madness a case of which we saw in 1960 through the kindness of a consultant in Perth : it is essential therefore that soon we provide full-scale laboratory help in the Mental Health service hospitals and this had been planned for 1961. Such a service will be a small return for the help we have received and are receiving from the Mental Health Services.

During 1960 the work of the haematology department was facilitated by the purchase of an electronic counting machine, the only one in Western Australia.

The haematology and biochemistry departments are continuing their joint endeavour to produce a satisfactory chemical method of assaying the blood levels of Vitamin B<sub>12</sub> and so replace the cumbersome technique at present in use.

## 5. Serology

The 1960 work of the serology section is summarised in Table III 5 appendix.

Apart from routine work, the biggest single item in 1960 was the Zoonoses Survey of Meat Workers. Results might be summarised as follows :—

### *Leptospirosis*

Serum Dilutions	....	....	1 : 10	1 : 30	1 : 100	1 : 300	1 : 1000	Total
Positive reactions ("one plus" or stronger)	....	....	14	25	25	4	1	69

1,028 sera tested by agglutination with a live *L. pomoma antigen*, locally prepared.

### *Brucellosis*

Serum Dilutions	....	....	1 : 20	1 : 40	1 : 80	1 : 160	1 : 320	1 : 640	Total
Positive reactions ("one plus" or stronger)	....	....	51	36	23	14	8	7	139

1,028 sera tested by agglutination with World Health Organisation *B. abortus antigen* purchased from the Commonwealth Serum Laboratories.

These findings in Brucellosis confirmed our 1959 view that this disease is much more common in Western Australia than is realised. This is very important because the disease is most difficult to diagnose without laboratory help, mimicking almost any other condition, even mental diseases, and when allowed to continue unchecked and untreated will lead to chronic ill-health.

### *Q Fever*

Serum Dilutions	....	....	....	....	....	....	1 : 8	1 : 64	1 : 128	Total
Positive reactions ("one plus" or stronger)	....	....	....	....	....	....	60	4	3	67

1,027 sera tested by complement fixation using *C. burnetii antigen* purchased from the Commonwealth Serum Laboratories.

The Serology laboratory's contribution to this survey also included the supply, cleaning, and re-sterilisation of syringes, needles, and specimen bottles.

"Follow-up" examinations were carried out on 24 sera for leptospirosis, 41 for brucellosis and eight for Q Fever.

### *Wassermann Reaction*

The technique employed for routine Wassermann tests for many years has been a hybrid, but a fairly consistent hybrid.

It was largely set down by Dr. A. Neave Kingsbury in 1939, based on the Medical Research Council's No. 1 method, using Donald's dropping technique, retaining water-bath fixation and plain physiological saline as a diluent and electrolyte.

In 1955, on Dr. Kovacs' recommendation, we commenced using a commercially prepared antigen in place of our homespun one. There was a marked fall in the number of non-specific, inexplicable "positive WR-negative flocculation" tests. It was apparent that our reaction had increased in specificity.



In December, 1960, Miss Jenkyn, greatly daring, but only after lengthy investigation, changed to an overnight 4°C fixation method, using Calcium and Magnesium in the saline, and a commercial Kolmer Cardiolipin antigen.

Correlation with our routine Kahn and VDRL tests is much improved. We appear to have gained in sensitivity without loss of specificity.

The Meinicke Test is still carried out on selected sera as well as the Wassermann, Kahn and VDRL tests, which are done as routine on all sera.

It is still necessary to send a small number of "difficult" sera to a reference laboratory, and we are indebted to Dr. Wilkinson of the V.D. Reference Laboratory, Whitechapel, London, for his assistance.

It is hoped that during 1961, a more conclusive test such as the Treponema Pallidum Immobilization, may be added to our battery in these laboratories, to avoid the delay and expense of sending sera oversea.

#### *Native Survey*

Sera from 174 natives in the Derby-Hall's Creek area were tested by the VDRL method, and 60 gave "positive" reactions. It must be kept in mind of course that these "positive" reactions may be due to other diseases than syphilis, *e.g.*, yaws and leprosy.

#### *Trachoma—Psittacosis Survey*

As is explained below, Para. IV Research, it has not yet been found possible to obtain an antigen giving specific reactions with individuals suffering from trachoma: it has been necessary instead to continue the use of the Ornithosis-L.G.V. antigen made by the Commonwealth Serum Laboratories. This antigen of course not only gives positive reactions with the sera of individuals suffering from trachoma but necessarily also gives reactions with the blood of individuals suffering from ornithosis and lymphogranuloma venereum. No one really knows the extent of the former disease in Western Australia and consequently it is difficult to assess the class of "positive" findings in individuals known to be suffering from trachoma, *e.g.*, of 123 individuals known to have suffered from or to be suffering from trachoma six gave "positive" reactions to a titre of 1/8 or higher. But similarly testing carried out on 568 random sera sent for other investigations yielded 43 showing "positive" reactions to a titre of 1/16 or higher using Commonwealth Serum Laboratories' antigen, and of 160 sera sent from aborigines in the Derby area 34 gave similar "positive" readings. In other words, of 737 unknown sera no less than 16 per cent. gave positive readings compared with five per cent. positive findings in individuals suffering from trachoma in all stages. It is agreed that a significant proportion of the "unknown" sera may have been from individuals suffering from trachoma but even when allowance is made for this it is obvious that some other condition is yielding positive results with the Commonwealth Serum Laboratories' antigen. This most disturbing finding is not limited to Western Australia: our colleagues in Queensland have reported identical findings and they have found the same levels as us in material sent from us to them for re-checking: these strange and unexplained reactions have been found even in countries such as Denmark and are under fuller investigation.

#### *Hydatid Complement Fixation Tests*

Although we have few requests for examination for hydatid disease, and very little opportunity to obtain "follow-up" information, we have had doubts for some time about the sensitivity of our hydatid antigens.

The occurrence of a proven human case yielded a supply of cyst material which enabled us to make a sensitive, specific antigen in June. We would be glad to receive fresh fluid or cyst material from other cases.

#### *Poliomyelitis Complement Fixation Tests*

A small number of preliminary tests were done, using imported commercial antigen. The series was stopped, because of the risk of live virus in the antigen, and possible danger to staff.

#### *Influenza Haemagglutination Inhibition Tests*

Sera from 45 members of the staff of the Commonwealth Health and allied departments were tested at the request of the Deputy Commissioner, using antigens prepared by the virus laboratory from four strains of influenza virus.

With receptor destroying enzymes kindly supplied by Dr. Ada of the Walter and Eliza Hall Institute, Melbourne, the tests were most satisfactory.

A method using Trypsin ("Diagnostic Procedures for Virus and Rickettsial Diseases" 2nd ed. p. 250) did not prove as satisfactory under our conditions.

#### *Viral Hepatitis (Monkey red cell haemagglutination tests)*

These were continued on all "likely" sera obtainable.

Because of difficulty of supply we substituted fresh monkey cells obtained by air from the Commonwealth Serum Laboratories, Melbourne, for the preserved frozen cells.

Where it was possible to correlate laboratory and clinical findings the test appeared to justify its earlier promise.

#### *Medico-legal*

During 1960 this laboratory was concerned with the investigation of 13 cases of death by violence, nine sex offences, and two other cases. These led to evidence being given in Court on 17 occasions (including appearances at Collie, Bunbury, and Gnowangerup).



As with all other sections of the central laboratories the serology department feels pressure of space, and future plans should include provision for :

- (a) a laboratory for virus serology,
- (b) a forensic laboratory,
- (c) a larger wash-up room near to but separated from the serology section,
- (d) facilities for handling patients.

## 6. *Histopathology*

For a continuous period of almost 50 years the Public Health Laboratories provided a valuable histopathology service to the State, at times the only laboratory to do so : the temporary closing-down of this service was unfortunate and caused much misunderstanding with medical practitioners. It is a marked step forward to be able to state that with the recruitment of Professor Stirrat presently to leave the Chair of Pathology at the University of Alberta we shall re-open the histopathology department for full work in 1961. Hitherto we have limited our work to small numbers of autopsy examinations and to examinations of considerable numbers of exfoliative cytology specimens. This cytology work is continuing to extend, especially with the use of fluorescent techniques, and is now assuming so much importance in the minds of the lay and medical public that it should be discussed in more detail.

As its name indicates, exfoliative cytology is the study of cells cast off by the body into cavity effusions, into sputum, into the vagina, urine faeces, gastric contents, etc. The specimens sent to this department for examination are limited generally to cells in pleural effusions, in sputum and in cervical smears : in the opinion of experienced workers this order is also the order of difficulty in interpretation, the most difficult cells to identify on occasion being those found in body effusions, with sputum a close second when its complex and varied cytology is taken into account. Possibly it may be of value to consider this type of investigation more fully.

### *Exfoliative Cytology of Cervical Smears*

This has received much publicity, with the result that to the uncritical it seems to offer an easy way of reducing the death rate from cancer of the uterus : in fact some authorities are now putting this method of attempted control into wide operation : there can be no doubt that when a cervical smear is sent for investigation from a medical practitioner whose suspicions have been aroused during a full physical examination then the examination of such smears is a fully worthwhile task. But this is very difficult from advocating widespread adoption of such examinations as a routine. To examine even one-quarter of the people at risk once every year would necessitate the employment of several individuals trained in "screening" routine specimens, and would not detect all individuals suffering from carcinoma of the cervix.

The above view does not change our statement that when smears are taken with discrimination during a routine examination, and are examined by a pathologist of experience then such investigations are fully justified. However we would qualify this in one way, namely, that such examinations must not be limited to a search merely for the presence or absence of cells suggesting carcinoma : in our laboratories each cervical smear is also examined for fungus infections which are very much more common a problem than is carcinoma of the cervix as has been shown by our results to date.

### *Exfoliative Cytology of Sputa*

If there be a semblance of a case for the widespread adoption of exfoliative cytology of cervical smears how much stronger is the case for the widespread adoption of exfoliative cytology of the sputum ; *e.g.*, an examination of the cervix can be carried out as a minor procedure but a bronchoscopic examination of the respiratory tract is a major undertaking and in any event is limited to the air passages : and the death rate from cancer of the lung is several times higher than the death rate from cancer of the cervix. However the same criticisms apply to the widespread examination of sputum cells as apply to the widespread examination of cervical material : the task would be a major one and quite unlikely to yield results in any way commensurate with the cost. But, in selected cases as in individuals with unidentified X-Ray shadows in the lungs, repeated careful searching of the sputum is a laboratory procedure which has long since proved its worth. In our experience in a patient with disease of the respiratory tract routine examinations of the sputum has a value far beyond merely a search for cancer cells : not only will such examinations mirror for the clinician the local reaction to treatment in a condition such as pneumonia : it will serve to detect eosinophilia and so explain an obscure lung condition ; or, as happened recently, show pollen grains in the sputum to have been the possible cause of an unexpected attack of asthma in a patient : or detect asbestosis where it was not expected ; and most often of all, routine sputum examinations will immediately detect the presence of fungi acting as saprophytes or present in the sputum as true pathogens. These other advantages of sputum examinations have been well described by American workers in "Fringe benefits."

## 7. *Parasitology*

So little of this work is done at present that it is not reported separately, being carried out as a routine by the Salmonella Investigation Unit on all samples of faeces sent to the unit. As already reported above, one interesting finding was hookworm as the explanation of anaemia in a group of mentally sick patients.

Amoebiasis and hookworm have already been mentioned in our 1959 report as conditions likely to cause trouble as the North-West is opened up but undoubtedly other protozoal and helminthic infections will come to light when time permits of surveys being conducted in the North of the State.



#### 4. BRANCH LABORATORIES

In Section 1 above details have been given of the opening of new branch laboratories and of possible new sites for such branch laboratories ; mention was made also of the great importance we attach to the work of such laboratories, and the care with which the staff must be chosen for these exacting positions. Men of the calibre required are not easy to come by. So far they have all been recruited from overseas but it is hoped that as trainees begin to qualify, then, after a period of work as technologists in the central laboratories, they will become available for promotion to Senior Technologist in charge of one or another of the country laboratories.

In turn the country laboratories can help the central laboratories with recruitment and help their own area in the sense that as each laboratory grows it requires individuals for work in a humbler capacity. Such posts are filled by local applicants and the best of such local workers will in due course be transferred to the central laboratories for full technical training : in 1960 one worker was transferred from Bunbury laboratory to the trainee staff of the central laboratory.

Table IV appendix gives a picture of the work done in the branch laboratories during 1960 but gives little idea of the heavy responsibilities of each post. We are indebted to these workers whose laboratories are stretched over an arc of almost 2,000 miles, from Albany to Derby, and who are called upon to work in conditions ranging from severe tropical to near-English. In 1960 one senior member of the service, in successive periods of duty, worked in Bunbury, Albany, Kalgoorlie and Derby, all without any word of complaint.

#### 5. RESEARCH

That research work is an important part of the duties of a public health laboratory service is shown by the fact that the English Public Health Laboratory Service is controlled by the Medical Research Council. The reason is not far to seek : routine repetitive work without a research stimulus becomes monotonous and leads to lowering of efficiency and standards, while pure research without routine to show the way, may wander off along sterile paths. Further, in a previous report we have stressed that the research techniques of to-day often become the routine methods of the morrow and this has been well shown by the brilliant original work of Dr. Kovacs on the cultivation and identification of the atypical mycobacteria. In the central laboratories there is no department which is not carrying out some greater or lesser research investigation as part of the day's work, e.g.,

*Tuberculosis Section.*—The research continues for a really cheap quick satisfactory way of growing tubercle bacilli ! And work continues on the testing of new drugs, together with the investigations instituted by the appearance, in numbers, of individuals suffering from disease due to the anonymous mycobacteria. Fluorescent microscopy is now used routinely in this department.

*General Microbiology* continue their investigations on methods of testing water purity, hand-cleansing ; methods of sterilising air in wards, etc.

*Biochemistry.*—In addition to other new laboratory tests the biochemistry department continues its search for easier spectrophotometric methods of assessing vitamin B<sub>12</sub> serum levels and also assists the histopathology department in attempts to obtain a radio-opaque fluid which will serve as an index of artery anastomosis.

*Serology.*—The serology department is still so heavily committed with certain viral investigation that it has not been able to begin full-scale investigation into the problem of toxoplasmosis in Western Australia.

*Haematology.*—During the year particular attention has been paid to evaluating certain tests for prothrombin levels.

*Mycology.*—The trying out of differential stains is the most promising work being carried out at present in the mycology department which hopes soon to try fluorescent techniques for searching for fungi in mixed material such as sputum.

*Histopathology.*—This department is also interested in fluorescent microscopy not in the sense of using fluorescein-linked antibody but in the sense of using differential fluorescent staining in search for carcinomata.

One form of research not previously mentioned is that of establishing whether or not individuals are born with a complete anastomotic circulation. So far it would seem that as indicated by previous work by us in other parts of the world, there is no doubt whatever that the Australian also possesses large collateral channels between the two sides of the heart's circulation.

The above small research projects are integrated into the routine work of each of the laboratories. There is one special unit however whose function is only research, namely, the Trachoma Research Unit. It is estimated that there are over 400 million trachoma patients in the world. It is certainly a disease causing much suffering and blindness and has been proved to be common among the aborigines of Western Australia and is now found in small incidence among white people in the State. Effective chemotherapeutic agents are available but their widespread use is difficult and is not without risk. It was felt therefore that for Western Australia the best hope of control of this disease lies in the production of a vaccine. The first step in the production of the vaccine is the recovery of the active virus and this has now been accomplished on three occasions. The second step is the production of an effective antigen with which to test infected individuals and so obtain some indication of the likely value of a vaccine. Unfortunately this has failed

so far. The Australian strain of trachoma virus, like certain other strains, will not grow on tissue culture which is essential for the production of good antigen : through the kindness of Dr. Collier of the Medical Research Council, United Kingdom, we have been supplied with one of his strains and it is hoped to obtain an antigen from this. As explained in the serology section the use of Commonwealth Serum Laboratories' Ornithosis group antigen has given a very confusing picture.

#### 6.—PUBLICATIONS

During the year the following papers were published by members of the laboratory staff :—

- (1) *Dr. Kovacs* published a letter on "The Control of Tuberculosis in Australia." *Med. Jl. Aust.*, 10.9.60, Vol. 47/II, No. 11, p. 435.
- (2) *Dr. D. Perret*, Virology Department, in collaboration with Dr. Ida Mann and others published the following two papers :—
  - (a) "Isolation of Virus from Embryonate Eggs Inoculated with Material from a Case of Trachoma in Western Australia." *Br. Jl. Ophthalmology*, **44**, 8, (503-5) August, 1960.
  - (b) "Experimental Trachoma Produced by a West Australian Virus." *Br. Jl. Ophthalmology*, **44**, 11, (641-8) November, 1960.
- (3) *Dr. Laurie* : publication concerning work which was not done here.

#### 7.—ACKNOWLEDGEMENTS

Without unduly extending this report it is not possible, adequately, to thank all who have helped us and we can only express our thanks in the most general of terms and hope this will be accepted.

Firstly, we must thank our landlords, the Perth Chest Hospital, and our medical and administrative colleagues in the Public Health Service. Also we are much indebted to the Mental Health Department.

And lastly, the Director wishes to point out that the continued high standard of the laboratory work is attributed to his colleagues of all ranks and particularly to Dr. Kovacs and to the Chief Technologist, Mr. Drummond.

Wm. LAURIE,  
Director, Public Health Laboratories Service.



Table III—1  
CENTRAL PUBLIC HEALTH LABORATORIES—SUMMARY OF WORK DONE, 1960  
GENERAL

Material	Source				1960 Total	1959 Total	1960 Increase
	State	Common- wealth	Hospital	Others			
<i>Microbiology :</i>							%
Tests ....	14,796	6,485	719	3,019	25,019	17,876	40·0
Unit Values ....	202,855	33,061	6,406	20,871	263,193	222,229	18·4
<i>Tuberculosis :</i>							
Tests ....	....	22,148	....	....	22,148	16,830	31·6
Unit Values ....	....	132,253	....	....	132,253	104,203	26·9
<i>Serology :</i>							
Tests ....	25,622	2,160	3	1,221	29,006	24,947	16·3
Unit Values ....	138,919	10,153	35	12,474	161,581	97,957	65·0
<i>Haematology :</i>							
Tests ....	2,512	8,387	1,890	6,501	19,290	10,107	90·9
Unit Values ....	13,184	28,212	7,259	19,187	67,842	28,076	141·6
<i>Biochemistry :</i>							
Tests ....	940	2,106	453	926	4,425	2,472	79·0
Unit Values ....	14,549	12,535	1,417	8,004	36,505	14,915	144·8
<i>Histopathology :</i>							
Tests ....	1,222	597	48	19	1,886	161	....
Unit Values ....	12,400	4,552	336	156	17,444	2,320	....
<i>Virology :</i>							
Tests ....	13,574	25	....	7,232	20,831	11,671	78·5
Unit Values ....	....	....	....	....	....	....	....
<i>Totals :</i>							
Tests ....	58,666	41,908	3,113	18,918	122,605	84,064	45·8
Unit Values ....	381,907	220,766	15,453	60,692	678,818	469,700	*44·5

\* Increase 44·5 per cent. without unit values for Virology.

Table III—2A1  
MICROBIOLOGY—SUMMARY OF WORK, 1960  
GENERAL  
(Includes Mycology, Salmonella and Water Examinations)

Material	Source				1960 Total	1959 Total	1960 Increase
	State	Common- wealth	Hospital	Others			
Animal Inoculations ....	97	6	....	3	106	104	% 1·9
Blood Specimens ....	141	44	6	98	289	231	25·1
C.S.F. Specimens ....	47	17	1	44	109	51	113·7
Faeces Specimens ....	516	146	2	216	880	781	12·7
Foodstuffs : Fresh ....	970	2	....	....	972	297	227·2
Foodstuffs : Frozen or Tinned	485	....	....	10	495	645	....
Fertiliser ....	32	....	....	....	32	5	....
Mycology Examinations ....	695	484	15	67	1,261	31	....
Sensitivity Tests ....	1,121	1,796	251	1,095	4,263	2,053	107·6
Serous Effusions ....	40	173	68	25	306	214	43·0
Sputum ....	805	1,871	72	88	2,836	1,262	124·7
Swabs—All sources ....	1,393	999	187	440	3,019	3,461	....
Urine Examinations ....	107	744	94	450	1,395	943	47·9
Vaginal Specimens ....	122	37	....	85	244	161	51·6
Venereal Diseases, including Gonorrhoea and Syphilis	599	10	....	304	913	761	20·0
Waters and Sewage Surveys	6,085	156	23	94	6,085	5,582	9·0
Others ....	1,541	....	....	....	1,814	1,294	40·2
<i>Totals :</i>							
Tests ....	14,796	6,485	719	3,019	25,019	17,876	40·0
Unit Values ....	202,855	33,061	6,406	20,871	263,193	222,229	18·4

Table III—2A2  
FUROXONE AND FURADANTIN—COMPARISONS

Organisms	Furoxone			Furadantin		
	Sensitivity	Resistance	Total	Sensitivity	Resistance	Total
Staphylococci     ....     ....	476 97·5%	12 2·5%	479	786 99%	10 1%	796
Pseudomonas Pyocyanea     ....	6 17%	29 83%	35	8 12%	58 88%	66
Proteus     ....     ....     ....	54 61%	34 39%	88	142 95%	7 5%	149
Diplococcus Pneumoniae     ....	81 99%	1 1%	82	122 99%	1 1%	123
B. Coli     ....     ....     ....	243 96%	10 4%	253	406 97%	13 3%	419
Enterococci     ....     ....     ....	102 96%	4 4%	106	181 99%	2 1%	183
N. Gonorrhoea     ....     ....	11 91%	1 9%	12	15 94%	1 6%	16
Streptococcus     ....     ....	39 81%	9 19%	48	110 100%	0 0%	110
Salmonella     ....     ....     ....	23 100%	0 0	23	53 100%	0 0	53
B. Aerogenes     ....     ....	45 98%	1 2%	46	68 77%	10 23%	78
B. Paracolon     ....     ....	52 95%	3 5%	55	86 90%	9 10%	95
B. Friedlanderi     ....     ....	16 94%	1 6%	17	38 95%	2 5%	40
Coliform Bacillus     ....     ....	8 100%	....	8	8 100%	....	8
Miscellaneous     ....     ....	12 46%	14 54%	26	13 35%	24 65%	37

Table III—2C1  
MICROBIOLOGY—SALMONELLA AND SHIGELLA INVESTIGATION UNIT EXAMINATIONS, 1960

Specimen	Total Examined	Salmonella Isolations	Shigella Isolations
Faeces     ....     ....     ....     ....     ....     ....	540	53	19
Egg Yolk/Yolk     ....     ....     ....     ....     ....	463	77	0
Desiccated Coconut     ....     ....     ....     ....     ....	286	29	0
Oysters     ....     ....     ....     ....     ....	282	0	0
Birds (Faeces Liver/Spleen)     ....     ....     ....     ....	301	4	0
Moore Swabs     ....     ....     ....     ....     ....	73	2	0
Pig Glands     ....     ....     ....     ....     ....	22	1	0
Kangaroo Meat     ....     ....     ....     ....     ....	3	3	0
Sputa     ....     ....     ....     ....     ....	4	3	0
Pleural Fluid     ....     ....     ....     ....     ....	4	3	0

In the above table the Salmonella isolations from Sputum and Pleural Fluid were from one case.



Table III—2C2  
MICROBIOLOGY—SHOWING SALMONELLA SEROTYPES ISOLATED, 1960

Salmonella Serotype	Human Source				Other Sources					
	Faeces		Pleural Fluid	Sputum						
	Cases	Isolations	Isolations	Isolations	Egg yolk pulp	Desiccated coconut	Birds	Moore Sw. (Reserv.)	Pig glands	Kangaroo meat
S. typhimurium ....	21	31	...	...	7	2	...	...	...	...
S. paratyphi B. ....	...	...	...	...	...	2	...	...	...	...
S. typhi ....	2	7	...	...	...	...	...	...	...	...
S. cholerae suis....	...	...	*3	*3	...	...	...	...	...	...
S. rubislaw ....	1	1	...	...	...	1	...	...	...	...
S. oranienburg ....	...	...	...	...	12	...	...	...	...	...
S. derby ....	...	...	...	...	...	...	...	...	1	...
S. birkenhead ....	...	...	...	...	...	...	1	1	...	...
S. meleagridis ....	...	...	...	...	3	...	...	...	...	...
S. thompson ....	...	...	...	...	...	3	...	...	...	...
S. bareilly ....	...	...	...	...	...	3	...	...	...	...
S. senftenburg ....	1	1	...	...	...	1	...	...	...	...
S. muenchen ....	1	1	...	...	...	...	...	...	...	...
S. hvittingfoss ....	...	...	...	...	...	2	...	...	...	...
S. waycross ....	...	...	...	...	...	7	...	...	...	...
S. adelaide ....	1	1	...	...	...	...	...	...	...	2
S. potsdam ....	...	...	...	...	...	...	...	...	...	1
S. onderstepoort ....	...	...	...	...	...	...	2	...	...	...
S. reading ....	1	1	...	...	...	...	...	...	...	...
S. orientalis ....	...	...	...	...	...	...	1	...	...	...
S. kotte ....	...	...	...	...	...	2	...	...	...	...
S. newport ....	...	...	...	...	...	3	...	...	...	...
S. butantan ....	...	...	...	...	...	1	...	...	...	...
S. bovis morbificans ....	2	2	...	...	2	...	...	...	...	...
S. nchanga ....	...	...	...	...	...	1	...	...	...	...
S. charity ....	...	...	...	...	...	...	...	1	...	...
S. newington ....	1	1	...	...	...	...	...	...	...	...
S. dahllem ....	1	1	...	...	...	...	...	...	...	...
S. ferlac ....	...	...	...	...	...	1	...	...	...	...
S. pullorum ....	...	...	...	...	49	...	...	...	...	...
Unidentified ....	2	6	...	...	4	...	...	...	...	...
Totals ....	34	53	3	3	77	29	4	2	1	3

\* The same patient.

Table III—2 D 1  
MICROBIOLOGY—TUBERCULOSIS SECTION—EXAMINATIONS IN 1960

Type of Examinations	1960 Total	1959 Total	1960 Increase
<i>Sputum</i> —			%
Direct Smears .... 301	13,768	11,127	23·7
Centrifuged Deposits .... 6,712			
Cultures .... 6,728			
Direct Guinea Pig Inoculations .... 27			
<i>Gastric Contents</i> —			
Centrifuged Deposits .... 172	1,315	970	35·5
Cultures .... 748			
Direct Guinea Pig Inoculations .... 395			
<i>Laryngeal Swabs</i> —			
Centrifuged Deposits .... 120	347	1,573	....
Cultures .... 120			
Direct Guinea Pig Inoculations .... 107			
<i>Bronchial Lavage</i> —			
Centrifuged Deposits .... 131	342	....	....
Cultures .... 132			
Direct Guinea Pig Inoculations .... 79			
<i>Pleural Fluid</i> —			
Direct Smears .... 2	317	327	....
Centrifuged Deposits .... 112			
Cultures .... 113			
Direct Guinea Pig Inoculations .... 90			
<i>C.S.F.</i> —			
Direct Smears ....	14	29	....
Centrifuged Deposits .... 4			
Cultures .... 5			
Direct Guinea Pig Inoculations .... 5			
<i>Urine</i> —			
Centrifuged Deposits .... 390	1,144	1,329	....
Cultures .... 388			
Direct Guinea Pig Inoculations .... 366			
<i>Miscellaneous</i> (great part of research work on animal tuberculosis)—			
Direct Smears .... 2	3,670	865	3 times
Centrifuged Deposits .... 1,665			
Cultures .... 1,653			
Direct Guinea Pig Inoculations .... 350			
<i>Virulence Tests</i> ....	87	51	70·6
<i>Sensitivity Tests</i> ....	1,137	551	106·4
<i>Serum</i> —			
INAH Level Assay ....	7	8	....
Total Examinations ....	22,148	16,830	31·6

Total number of cultures 1960	9,887
No. of positive cultures in 1960	1,076 (10·9%)
No. showing <i>Mycobacteria tuberculosis</i>	744 (69·1%)
No. showing Unclassified mycobacteria	332 (30·9%)



Table III—2 E 1							
MICROBIOLOGY—VIRUS SECTION—WORK DONE, 1960							
Work done	Source				1960 Total	1959 Total	1960 Increase
	State	Common- wealth	Various Hospitals and University	Others			
Preparation Inocula ....	733	9	190	70	1,002	467	% 114·6
Tissue Culture ....	1,227	....	2,114	1,188	4,529	2,378	90·5
Egg Inoculation ....	5,632	....	299	220	6,151	4,394	40·0
Animal Inoculation ....	1,334	....	1,499	791	3,624	2,032	78·3
Neutralisation ....	199	....	189	76	464	40	10 times
Haemadsorption ....	222	....	39	240	501	190	163·7
Haemagglutination and Inhibition ....	381	....	54	176	611	1,507	....
Sterility Tests ....	875	....	48	2	925	645	43·4
Others ....	2,971	16	37	....	3,024	18	....
Tests ....	13,574	25	4,469	2,763	20,831	11,671	78·5

Table III—2 E 2											
MICROBIOLOGY—VIRUS LABORATORY WORK, 1960											
<i>Analysis of Results, 1960</i>											
Month	No. of Patients	No. of Specimens	No. of Tests	Viruses Isolated	Nature of Virus Isolated						
					Echo 9	Coxsackie		Un- identified	Parain- fluenzae (Haemad- sorption) Virus	Polio- virus	Herpes
January ....	10	12	298	2	....	A	B	....	....	1	....
February ....	17	24	589	1	....	....	1	....	....	....	....
March ....	17	19	528	2	....	....	....	2	....	....	....
April ....	9	40	480	1	....	....	....	....	....	....	1
May ....	17	21	685	3	....	....	....	2	....	1	....
June ....	12	22	597	....	....	....	....	....	....	....	....
July ....	35	43	827	2	....	....	....	....	2	....	....
August ....	23	31	1,113	2	....	....	....	1	....	1	....
September ....	15	21	966	1	....	....	....	....	1	....	....
October ....	14	16	589	....	....	....	....	....	....	....	....
November ....	16	21	458	3	3	....	....	....	....	....	....
December ....	19	21	582	1	....	....	....	....	....	....	1
Totals ....	204	291	7,712	18	3	....	1	6	3	3	2
Average/month....	17	24	643	....	....	....	....	....	....	....	....

This table represents procedures for diagnostic purposes only.

Table III—3							
BIOCHEMISTRY DEPARTMENT—WORK DONE, 1960							
Work Done	Source				1960 Total	1959 Total	1960 Increase
	State	Common- wealth	Hospital	Others			
Serum/Plasma Tests ....	831	1,752	196	787	3,566	1,848	% 93·0
C.S.F. Tests ....	52	22	2	66	142	129	10·1
Gastric Content Examinations	....	3	....	....	3	14	....
Effusions ....	13	40	15	4	72	67	7·5
Urine Examinations ....	29	112	5	44	190	249	....
Metabolic Tests ....	1	38	1	8	48	64	....
Preparation Solutions ....	An important and heavy demand but not easily capable of analysis.						
Others ....	14	139	234	17	404	101	....
Totals—							
Tests ....	940	2,106	453	926	4,425	2,472	79·0
Unit Values ....	14,549	12,535	1,417	8,004	36,505	14,915	144·8

Table III—4  
HAEMATOLOGY DEPARTMENT—WORK DONE, 1960

Tests Done	Source				1960 Total	1959 Total	1960 Increase
	State	Common- wealth	Hospital	Others			
Red Cells—							%
Total levels ....	165	111	16	447	739	452	63·5
Haematocrit ....	221	744	186	596	1,747	916	90·7
Absolute values ....	523	913	191	1,439	3,066	1,323	131·7
Sedimentation ....	151	465	57	329	1,002	714	40·3
Film examinations ....	216	910	168	548	1,842	834	120·9
Fragility tests ....	1	....	....	....	1	3	....
Reticulocytes ....	6	12	....	13	31	245	....
Stipple cells ....	3	....	....	1	4	30	....
Haemoglobin levels ....	247	817	198	642	1,904	1,332	42·9
White Cells—							
Total ....	223	785	200	461	1,669	1,297	28·7
Differential ....	218	781	200	398	1,597	1,279	24·9
Lupus erythematosis cells ....	....	15	6	6	27	43	....
Blood Grouping—							
Major ....	81	329	67	565	1,042	291	2½ times
Minor ....	81	329	67	566	1,043	292	2½ times
Compatibility ....	2	268	87	....	357	216	65·3
Bone marrow examination	8	4	....	4	16	6	1½ times
Coagulation Tests—							
Prothrombin time ....	57	327	61	98	543	327	66·1
Bleeding time ....	2	11	3	....	16	17	....
Clotting time ....	3	21	3	....	27	30	....
Clot retraction ....	2	....	1	4	7	2	2½ times
Others ....	302	1,545	379	384	2,610	458	4½ times
Totals—							
Tests ....	2,512	8,387	1,890	6,501	19,290	10,107	90·9
Unit Values ....	13,184	28,212	7,259	19,187	67,842	28,076	141·6

Table III—5  
SEROLOGY DEPARTMENT—WORK DONE, 1960

Work Done	Source				1960 Total	1959 Total	1960 Increase
	State	Common- wealth	Hospital	Others			
Treponemal Tests ....	14,763	1,516	....	....	16,279	15,082	% 8·0
Gonococcal Tests ....	1,161	221	....	....	1,382	1,409	....
Hydatid Tests ....	37	16	....	....	53	43	23·3
Bacterial Agglut. ....	3,723	164	....	42	3,929	3,976	....
Rheumatism Tests ....	511	136	....	54	701	786	....
Leptospiral Tests ....	1,323	6	....	....	1,329	80	16 times
Viral Rickettsial Tests ....	3,302	46	1	....	3,349	1,383	142·2
Hormone Tests ....	118	24	2	1,125	1,269	1,391	....
Medico-Legal Tests ....	525	....	....	....	525	542	....
Others ....	159	31	....	....	190	255	....
Total—							
Tests ....	25,622	2,160	3	1,221	29,006	24,947	16·3
Unit Values ....	13,819	10,153	35	12,474	161,581	97,957	65·0



Table III—6  
HISTOPATHOLOGY DEPARTMENT—WORK DONE, 1960

Type of Examination		Source				1960 Total	1959 Total	1960 Increase
		State	Common- wealth	Hospital	Others			
Exfoliative Cytology	....	1,192	597	48	19	1,856	154	%
Autopsies	.... ....	30	....	....	....	30	7	....
Biopsies	.... ....	....	....	....	....	....	....	23·3
Tissue Examinations	....	....	....	....	....	....	....	....
Totals—								
Tests	.... ....	1,222	597	48	19	1,886	161	10 times more
Unit Values	....	12,400	4,552	336	156	17,444	2,320	7 times more

Table IV  
SATELLITE LABORATORIES—WORK DONE, 1960

Source Laboratory Sections	Bunbury	Wooroloo	Albany opened February, 1960	Geraldton opened June, 1960	Northam opened August, 1960	Derby opened September, 1960	1960 Total	1959 Total	1960 Increase
Bacteriology— Tests	....	....	....	....	....	....	....	....	%
Haematology— Tests	....	....	....	....	....	....	....	....	....
Biochemistry— Tests	....	....	....	....	....	....	....	....	....
Totals—									
Tests	....	....	....	....	....	....	....	....	....
Unit Values	....	....	....	....	....	....	....	....	....

## Appendix III

### TUBERCULOSIS CONTROL BRANCH

Director	....	....	....	Dr. F. G. B. Edwards.
Perth Chest Clinic	....	....	....	Dr. K. J. M. Carruthers.
				Dr. W. S. Haynes.
Fremantle Chest Clinic	....	....	....	Dr. R. M. Porter
Kalgoorlie Chest Clinic	....	....	....	Dr. J. McNulty.
Perth Chest Hospital	....	....	....	Dr. H. R. Elphick (Physician Superintendent).
				Dr. W. G. Smith. (Acting Assistant Physician Superintendent)
				Dr. J. Elder.
				Dr. P. Z. Fisher.
				Dr. J. G. Denton.
				Dr. V. E. Dadds.
Pulmonary Function Unit	....	....	....	Dr. F. E. Heymanson.

#### NEW CASES

The number of tuberculosis cases discovered in this State continues to show a gradual decline year by year. 330 tuberculosis notifications were reported during 1960, these being classified as follows :—

Pulmonary (adult type)	....	....	....	....	....	....	....	282
Pleurisy with Effusion	....	....	....	....	....	....	....	14
Non Pulmonary—								
Meningitis	....	....	....	....	....	....	....	2
Glands	....	....	....	....	....	....	....	11
Skeletal	....	....	....	....	....	....	....	7
Genito-urinary	....	....	....	....	....	....	....	8
Abdominal	....	....	....	....	....	....	....	2
Other	....	....	....	....	....	....	....	4
							34	

15 infections occurred in children under 15 years, including the two cases of meningitis. The increase in frequency amongst older people continues, 63 per cent. of notifications being amongst those of 45 years and over, as compared with 59 per cent. in 1959.

#### STATE OF THE REGISTER

At the end of 1959 there were 2,792 cases on the Register, 108 of which were non-pulmonary. 670 names were removed during 1960 and at the end of the year there remained 2,506 on the Register, of which 118 were non-pulmonary.

It is our practice in pulmonary cases to remove patients from the Register after a five-year period of inactivity, judged by bacteriological and radiological standards, unless the disease process has been virtually wholly resected, in which case they are removed after three years' inactivity. For non-pulmonary disease two years' retention on the Register is considered enough.

#### CASE FINDING

Private practitioners, mass surveys, and Chest Clinics continued to supply the main stream of new cases.

Compulsory mass X-ray surveys proceeded at a quieter pace pending completion of plans for a third Metropolitan survey to commence early in 1961, and were confined to certain country areas, including the Goldfields, Collie Coalfields, some South-West Road Boards, the Eastern Wheat Belt and the Kimberley and Murchison areas. 36,329 micro films were taken, 40 cases of significant tuberculosis being discovered, representing an incidence of 1.1 per 1,000 films.

#### EPIDEMIOLOGY AND PREVENTION

Children from 19 schools and kindergartens in Metropolitan and country areas were tuberculin tested with the Heaf gun. The ages of these children ranged from 3 to 17 years and the tuberculin positive rate of 12.3 per cent. would seem to be higher than expected. However, a large proportion showed a Grade I reaction only and it is probable that many of these were non-specific, in view of the presence of the endemic strain of Group III unclassified mycobacteria in Western Australia.

Ninety-nine of these children showing a Grade III or IV Heaf reaction were given a six months' course of prophylactic Isoniazid, and a careful follow-up will be made of these together with follow-up of a controlled group of untreated hyper-reactors.



## UNCLASSIFIED (ANONYMOUS) MYCOBACTERIA

Since 1955, anonymous mycobacteria have been isolated from 179 patients. Group II (scotochromogens), Group III (nonchromogens), and Group IV (rapid growers) have been identified. So far, persistent isolations have involved non-chromogens only, this occurring in 40 patients. Of the latter, 24 could be considered as possibly having disease due to these organisms and of these a smaller number showed a probability of such an infection. Drug sensitivity tests showed resistance to all three, or two, standard anti-tuberculous drugs in the large majority. Nearly all patients from whom anonymous mycobacteria were isolated had chronic pulmonary disease, *e.g.*, tuberculosis (active or inactive), silicosis, silico-tuberculosis, pulmonary fibrosis, bronchitis and emphysema, carcinoma, asbestosis. The organisms have not so far been identified in sputum from patients with normal lungs.

### *Tests with P.P.D.-B.*

In 1960, 500 mental hospital patients were simultaneously skin tested with P.P.D.-S. and P.P.D.-B. (obtained from America), using five tuberculin units or its equivalent, given intradermally. 50 per cent. reacted to P.P.D.-B., and 9 per cent. gave a larger reaction to P.P.D.-B. than to P.P.D.-S. One should be cautious in interpreting these results, at least until further group community tests are carried out, including testing of school children with Battey-type P.P.D. derived from the local endemic strain of Group III organisms.

## PNEUMOCONIOSIS IN RELATION TO PULMONARY TUBERCULOSIS

Tuberculosis remains a problem in the mining areas. A third mass survey of the Kalgoorlie-Boulder Goldfields district during the year produced a crop of new notifications representing an incidence of 2.1 per 1,000 persons X-rayed.

Tables 7 and 8 show the state of affairs, in that yearly notifications amongst miners, ex-miners, and the non-mining population in the goldfields have shown no falling off in the last few years, despite active control measures, such as repeated surveys, close supervision of tuberculosis cases and careful follow-up of mine workers, whether showing evidence of silicosis or not. This disappointing result must be due to other factors, such as the predisposition of silicotics to tuberculosis and the ineffectiveness of dust control measures, as suggested by the large numbers of silicosis cases still arising in the industry.

## FUTURE PLANS

(1) Continuation of mass compulsory X-ray surveys in Metropolitan and country areas, with more frequent surveys in districts where larger numbers of cases have appeared.

(2) Special consideration to the mining problem, including possibly prophylactic chemotherapy in miners and ex-miners who show a positive tuberculin reaction.

(3) Continuation of school tuberculin surveys and prophylactic isoniazid therapy for strongly positive reactors.

(4) Completion of the installation of miniature X-ray units in the larger hospitals for routine filming of in and out patients.

(5) Tightening up of the system of routine bacteriological testing of all patients attending clinics with any evidence of significant tuberculosis lesions, including those with calcified foci.

(6) Careful follow-up of contacts of known cases, especially aimed at those living in remote country areas.

(7) Skin testing of patients bacteriologically positive for Group III (unclassified) mycobacteria, their contacts and other community groups with P.P.D. derived from the endemic strain, and with other "tuberculins" as thought necessary.

F. G. B. EDWARDS, B.A., LL.B., M.B., B.S.,

Director, Tuberculosis Control Branch.

Table 1  
TUBERCULOSIS—MAIN STATISTICAL FIGURES

Year	Mean Popu- lation 1,000s.	Notifications				No. on Register Pulm.	Preva- lence per 100,000 Pulm.	Number Receiv- ing T.B. Allow- ance	Deaths			Death Rate per 100,000	
		Pulm.	Non- Pulm.	Total	Pulm. per 100,000				Pulm.	Non- Pulm.	Total	Pulm.	All Forms
1950	558	586	18	604	104.8	2,100	376	515	125	3	128	22.4	22.9
1951	580	467	37	504	80.4	2,402	413	474	76	6	82	13.1	14.1
1952	601	508	49	557	84.2	2,574	428	396	75	7	82	12.5	13.6
1953	621	378	34	412	60.6	2,762	445	361	43	3	46	6.9	7.4
1954	640	348	34	382	54.3	2,769	432	326	57	4	61	8.9	9.5
1955	659	413	39	452	63.7	2,965	450	330	31	2	33	4.7	5.0
1956	677	424	44	468	62.6	2,900	428	264	43	3	46	6.3	6.8
1957	692	332	32	364	47.9	2,786	403	198	36	1	37	5.2	5.3
1958	706	355	24	379	50.3	2,726	386	213	22	4	26	3.1	3.4
1959	726	320	34	354	44.1	2,684	369	182	24	....	24	3.3	3.3
1960	731	296	34	330	40.5	2,388	327	148	29	1	30	4.0	4.1

Table 2  
ANNUAL NOTIFICATIONS OF PULMONARY TUBERCULOSIS SHOWING STAGE OF DISEASE\*

Parenchymal Disease							Pleural Effusion		Total
Year	Minimal		Moderately Advanced		Advanced				
		%		%		%		%	
1952	122	24	275	54.1	101	19.9	10	2	508
1953	98	25.9	210	55.5	65	17.2	5	1.4	378
1954	96	27.6	178	51.1	74	21.3	....	....	348
1955	111	26.9	225	54.5	64	15.5	13	3.1	413
1956	127	38	217	51.1	72	17	8	1.9	424
1957	102	30.7	163	49.1	61	18.4	6	1.8	332
1958	91	25.6	187	52.7	72	20.3	5	1.4	355
1959	103	32.2	151	47.2	55	17.2	11	3.4	320
1960	89	30.1	144	48.6	49	16.6	14	4.7	296

\* Classified according to Diagnostic Standards N.T.A.

Table 3  
TUBERCULOSIS NOTIFICATIONS FOR THE YEAR ENDED 31ST DECEMBER, 1960  
*Showing Age, Sex, Form and Stage of Disease*

Age Group	Males					Females					Persons					Total
	Pulmonary			N.P. T.B.	Pleur. Effus.	Pulmonary			N.P. T.B.	Pleur. Effus.	Pulmonary			N.P. T.B.	Pleur. Effus.	
	Min.	Mod.	Adv.			Min.	Mod.	Adv.			Min.	Mod.	Adv.			
0- 4	1	....	....	3	....	1	....	....	5	....	2	....	....	8	....	10
5- 9	....	....	....	1	....	....	....	....	2	....	....	....	....	3	....	3
10-14	1	....	....	....	....	1	....	....	....	....	2	....	....	....	....	2
15-19	....	....	....	1	....	....	1	....	2	....	....	1	....	3	....	4
20-24	....	2	2	2	2	1	2	....	....	1	1	4	2	2	3	12
25-29	3	2	....	3	1	5	4	....	2	....	8	6	....	5	1	20
30-34	7	5	1	1	....	5	3	....	1	....	12	8	1	2	....	23
35-39	5	9	2	....	2	3	2	1	....	1	8	11	3	....	3	25
40-44	6	7	3	1	....	1	3	....	1	1	7	10	3	2	1	23
45-49	9	9	4	....	3	2	4	....	....	....	11	13	4	....	3	31
50-54	4	23	2	1	2	7	5	2	4	....	11	28	4	5	2	50
55-59	12	12	7	....	....	....	1	....	....	....	12	13	7	....	....	32
60-64	7	13	9	....	1	1	1	....	....	....	8	14	9	....	1	32
65-69	....	11	5	....	....	....	3	1	....	....	....	14	6	....	....	20
70-74	5	8	2	....	....	1	1	....	3	....	6	9	2	3	....	20
75-	1	12	8	1	....	....	1	....	....	....	1	13	8	1	....	23
Total	61	113	45	14	11	28	31	4	20	3	89	144	49	34	14	330



Table 4

SHOWING RESULTS OF TUBERCULIN SURVEY OF SCHOOLCHILDREN

Heaf Gun Tests—												
Total number tested											8,203	
Total number read											8,040	
Less number previously vaccinated											118	
Number Analysed											7,922	
Of whom—												
Number of negative reactors											6,945	
Number of positive reactors—Heaf Gun—Grade I											640	
Number of positive reactors—Heaf Gun—Grade II											204	
Number of positive reactors—Heaf Gun—Grade III											123	
Number of positive reactors—Heaf Gun—Grade IV											10	
Total number of positive reactors											977	
X-rays—												
Number of positive reactors X-rayed											972	
Number of normal X-rays											965	
Number of abnormal X-rays											7*	

DETAILS OF REACTIONS

Age (yrs.)	No. Tested	No. Negative	Positive Reactors					
			Grade I	Grade II	Grade III	Grade IV	Total	Per cent.
3    ....    ....	3	3	....	....	....	....	....	0
4    ....    ....	22	22	....	....	....	....	....	0
5    ....    ....	150	147	3	....	....	....	3	2.0
6    ....    ....	336	320	7	1	....	....	8	2.6
7    ....    ....	324	310	14	....	....	....	14	4.3
8    ....    ....	363	343	18	1	1	....	20	5.5
9    ....    ....	412	390	17	2	2	1	22	5.3
10    ....    ....	459	431	21	3	4	....	28	6.1
11    ....    ....	528	487	33	3	5	....	41	7.8
12    ....    ....	998	903	77	10	7	1	95	9.5
13    ....    ....	1,573	1,402	114	42	14	1	171	10.9
14    ....    ....	1,141	967	123	31	19	1	174	15.3
15    ....    ....	795	623	96	55	18	3	172	21.6
16    ....    ....	560	421	80	32	25	2	139	24.8
17 and over....	258	168	37	24	28	1	90	34.9
Total    ....	7,922	6,945	640	204	123	10	977	12.3

\* Includes 1 case of active pulmonary T.B.

Table 5

SHOWING PATIENTS FROM WHOM UNCLASSIFIED (ANONYMOUS) MYCOBACTERIA WERE ISOLATED 1955-60

				Casual Isolations	Intermittent Isolations	Persistent Isolations	Total Patients
Group II—							
1955-58	....	....	....	2	....	....	2
1959	....	....	....	2	1	....	3
1960	....	....	....	4*	2	....	6
				8	3	....	11
Group III—							
1955-58	....	....	....	7	1	9	17
1959	....	....	....	30*	5	14	49
1960	....	....	....	47	6	16	69
				84	12	39†	135
Group IV—							
1955-58	....	....	....	5	....	....	5
1959	....	....	....	6	....	....	6
1960	....	....	....	12*	....	....	12
				23	....	....	23
Mixed 1955-60—							
Group II and III	....	....	....	3	....	1	4
Group III and IV	....	....	....	5	....	0	5
				8	....	1	9
Not Grouped	....	....	....	1	....	....	1
Total	....	....	....	124	15	40	179

\* Including 1 culture from urine.

† Including 4 cases with cultures from pus from cervical glands.

Table 6  
SHOWING LESIONS IN PATIENTS WITH PERSISTENT ISOLATIONS OF UNCLASSIFIED (ANONYMOUS)  
MYCOBACTERIA 1955-60

	Lesion possibly due to Unclassified Mycobacteria				Disease prob- ably due to other aetiology	Total
	Pulmonary	Cervical glands	Urinary	Total		
Group II    ....    ....    ....	....	....	....	....	....	....
Group III   ....    ....    ....	18	4	1	23	16	39
Group IV    ....    ....    ....	....	....	....	....	....	....
Mixed Groups II and III ....	1	....	....	1	....	1

Table 7  
SHOWING RESULTS OF PERIODICAL EXAMINATION OF MINE WORKERS

Year	Total number of examinations	Total number of silicosis cases diagnosed	New cases of silicosis (previously normal or linear markings only)	Silico-tuberculosis and Tuberculosis without Silicosis
1950    ....    ....	6,203	349	14	12
1951    ....    ....	5,721	305	13	12
1952    ....    ....	5,959	294	9	12
1953    ....    ....	5,312	356	80	3
1954    ....    ....	6,179	487	158	16
1955    ....    ....	5,506	497	70	5
1956    ....    ....	5,476	474	30	9
1957    ....    ....	4,811	483	34	10
1958    ....    ....	6,286	582	54	8
1959    ....    ....	7,269	569	71	10
1960    ....    ....	7,385	530	50	12

Table 8  
SHOWING PULMONARY TUBERCULOSIS NOTIFICATIONS IN THE KALGOORLIE-BOULDER  
GOLDFIELDS 1950-1960

Year							Miners	Ex-Miners	Total Mining	Non-Mining Population	Total
1950    ....    ....    ....    ....    ....    ....							9	5	14	14	28
1951    ....    ....    ....    ....    ....    ....							10	5	15	3	18
1952    ....    ....    ....    ....    ....    ....							10	24	34	51	85*
1953    ....    ....    ....    ....    ....    ....							1	3	4	8	12
1954    ....    ....    ....    ....    ....    ....							12	9	21	5	26
1955    ....    ....    ....    ....    ....    ....							1	2	3	5	8
1956    ....    ....    ....    ....    ....    ....							4	24	28	18	46*
1957    ....    ....    ....    ....    ....    ....							7	8	15	11	26
1958    ....    ....    ....    ....    ....    ....							12	16	28	11	39
1959    ....    ....    ....    ....    ....    ....							8	10	18	18	36
1960    ....    ....    ....    ....    ....    ....							13	12	25	18	43*
Totals    ....    ....    ....    ....    ....    ....							87	118	205	162	367

\* Compulsory Mass X-ray Survey Years.



Table 9

SHOWING PULMONARY TUBERCULOSIS NOTIFICATIONS AS A RESULT OF COMPULSORY  
MASS X-RAY SURVEYS AMONGST THE NON-MINING POPULATION

*Rates per 1,000 micro films*

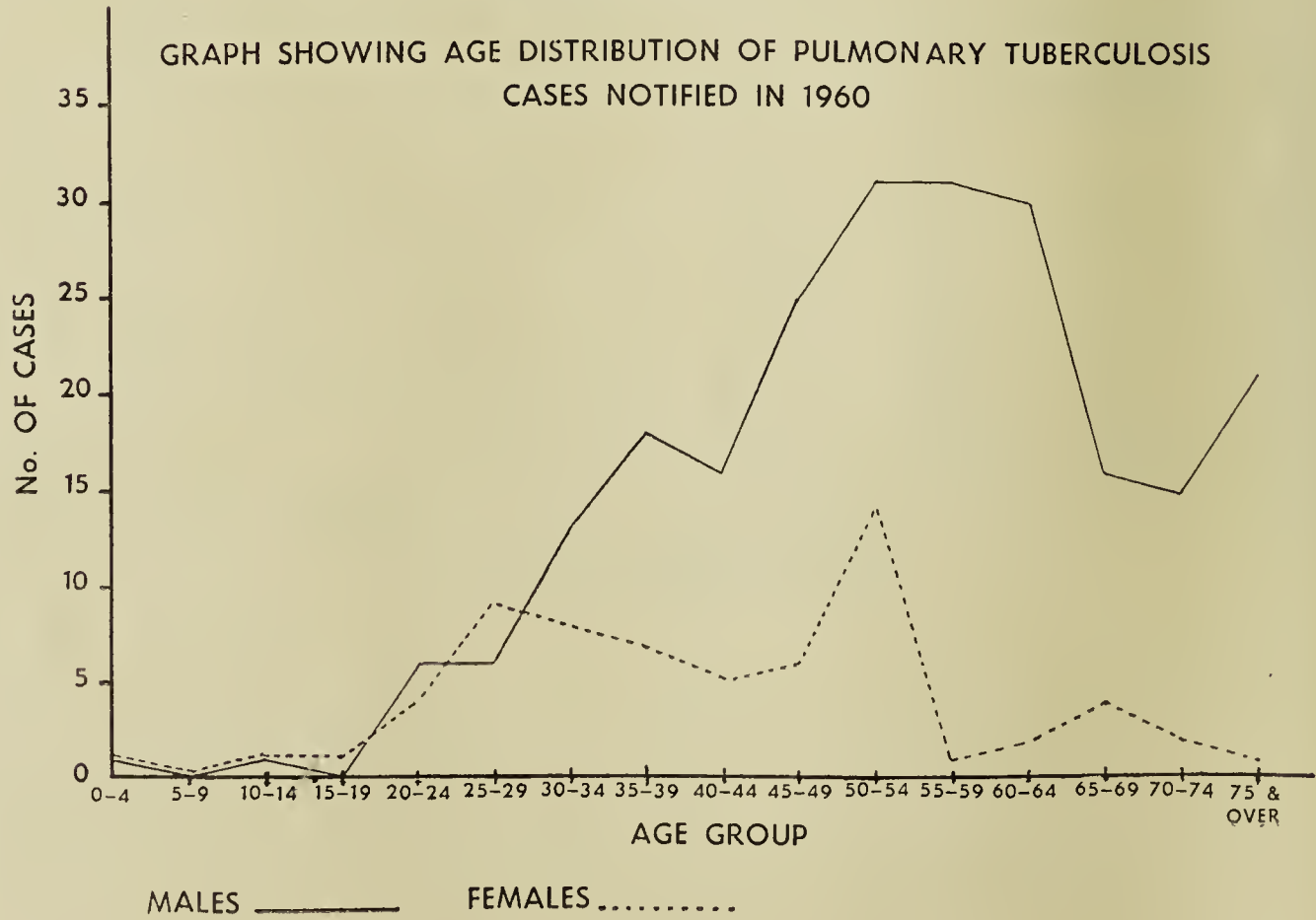
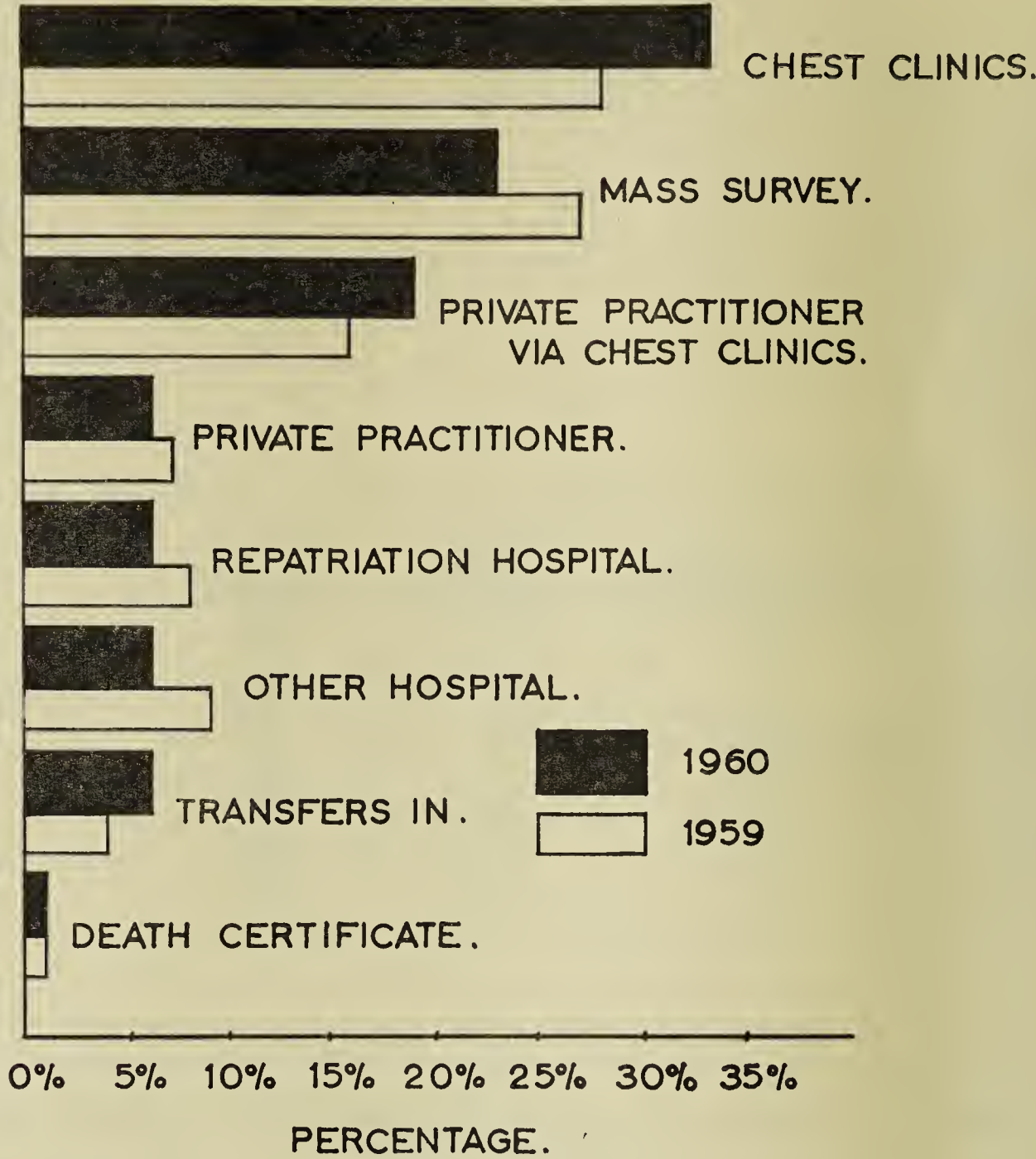
Year							Kalgoorlie-Boulder (non-Mining only)	Country (excluding Kalgoorlie-Boulder)	Metropolitan
1952	....	....	....	....	....	....	4·8	....	....
1953	....	....	....	....	....	....	....	2·0	....
1954	....	....	....	....	....	....	....	0·9	1·7
1955	....	....	....	....	....	....	....	1·7	1·3
1956	....	....	....	....	....	....	2·0	1·6	1·5
1957	....	....	....	....	....	....	....	0·8	0·8
1958	....	....	....	....	....	....	....	0·8	0·7
1959	....	....	....	....	....	....	....	1·2	0·8
1960	....	....	....	....	....	....	2·1	1·2	....

Table 10

SHOWING TUBERCULOSIS NOTIFICATIONS IN MIGRANTS, 1960

Arrived prior to 12/2/48	Arrived subsequent to 12/2/48				Total Migrants Notified
	British Full-Fare	British Assisted	Aliens	Total	
73	15	13	29	57	130

GRAPH SHOWING THE SOURCE OF NOTIFICATION OF CASES OF PULMONARY TUBERCULOSIS AS PERCENTAGE OF TOTAL NOTIFICATIONS.





Appendix IV

REPORT OF THE PHYSICIAN SUPERINTENDENT,  
PERTH CHEST HOSPITAL

The Director,  
Tuberculosis Control Branch,  
17 Murray Street,  
Perth.

I have the honour to present the annual report for Perth Chest Hospital for the year ending 31st December, 1960. The year was the first in which all wards were open for a total period of 12 months, and 898 patients received treatment during the year. Twenty beds were available for non-tuberculous patients until towards the end of the year when it was found possible to increase this number to 40. With the more rapid turnover in the non-tuberculous beds, a large number of cases were treated, and it is felt that the hospital is making a valuable contribution to the welfare of the community in providing excellent facilities for the treatment of chest diseases.

TREATMENT OF TUBERCULOSIS

The routine of treatment adopted in previous years was again followed throughout the year, there having been no new drugs introduced to justify any alteration. Immediately after the collection of specimens for bacteriological investigation, all patients admitted with presumably active tuberculosis commenced treatment with 1 gram Streptomycin, 12 grams P.A.S., and 300 mg. Isoniazid daily. This combination was continued until information was available regarding the drug sensitivity of the bacterial population, when combinations of two of the standard drugs were continued until discharge. On discharge every patient was advised to continue P.A.S. and Isoniazid for an aggregate period of two years. As a result there was conversion of the sputum in all new patients, 65 converting within three months, 43 within six months, and three in eight months ; and only three patients admitted during the year with old disease and resistant organisms remained persistently positive. Including re-admissions to the hospital during the year, there were 10 cases of chronic sputum-positive tuberculosis with drug resistant organisms treated throughout the year. One of these had a three-stage thoracoplasty which resulted in cavity closure and marked reduction of sputum, which remained positive on culture, however, five months after surgery. One had the removal of an infected plomb and a subsequent thoracoplasty with temporary conversion, and considerable reduction in amount, of sputum. Thoracoplasty is planned for a third, and two converted following the resumption of treatment with full doses of standard chemotherapy. In five cases of advanced disease, age and general debility preclude any active interference, and varied combinations of standard and secondary drugs have proved ineffective in achieving sputum conversion.

*Pulmonary Disease Due to Unclassified Mycobacteria*

“ Atypical ” or unclassified mycobacteria were discovered in the sputum of 14 new patients admitted to hospital during the year, but only three of them were regarded as suffering from disease due to these organisms. These patients presented with cavities excreting acid fast bacilli, which were consistently identified as Group III (Battey) unclassified mycobacteria. Two of them were subjected to surgery with conversion of sputum, while the third remained consistently positive. In the remaining 11 patients the unclassified organisms were considered to be of no clinical significance. In one the organisms were found in a case of “ typical ” tuberculosis and the remainder were cases of silicosis with no evidence of superimposed pathology.

*Surgery*

The necessity for surgical treatment of tuberculous disease was again limited by the excellent results of chemotherapy. The details of operative procedures performed on tuberculosis patients during the year are as follows :—

Right Upper Lobectomy	....	....	....	....	....	....	....	....	3
Segmental Resection	....	....	....	....	....	....	....	....	2
Thoracoplasty	....	....	....	....	....	....	....	....	8
Removal of lucite plomb and thoracoplasty	....	....	....	....	....	....	....	....	3
Decortication for chronic empyema	....	....	....	....	....	....	....	....	2
Plication of paralysed diaphragm (post-lobectomy)	....	....	....	....	....	....	....	....	1

Of the total operations four thoracoplasties and two lobectomies were performed in cases of “ atypical ” tuberculosis (one of these had a thoracoplasty which failed to convert his sputum, and right upper lobectomy was therefore performed).

We are again sincerely grateful to Mr. F. J. Clark, Senior Thoracic Surgeon, and Messrs. J. A. Simpson and P. Gibson, whose continued interest in the treatment of all cases has been a stimulus to the medical staff throughout the year, and whose assistance has been readily available in all cases requiring surgical intervention.

MEDICAL STAFF

Following two years of invaluable service my assistant superintendent, Dr. J. T. Smyth, was appointed assistant to the Professor in the University Department of Medicine. To permit him to extend his experience in general medicine Dr. Smyth was granted one year’s leave, and we trust that at the end of this time, or an extended period, he will return to the staff of the Chest Hospital.



In accordance with our desire to employ young physicians for a short term in an effort to provide specialised post-graduate training in chest diseases, Dr. E. T. Owen was appointed as a third-year resident and remained for six months, thereafter returning to Royal Perth Hospital. Unfortunately, it was not possible subsequently to obtain a replacement for him, but we were assisted considerably by the temporary appointment of Dr. H. G. Breidahl, who rendered valuable assistance during the latter part of the year.

Post-graduate tuition was provided for several doctors studying for higher degrees throughout the year, and undergraduates spent two weeks of their final year as clinical clerks in the wards.

#### LABORATORY

A full laboratory service, with the exception of histopathology, was provided by the Public Health Laboratories within the hospital, and we are grateful to the Director of Laboratories, Dr. W. Laurie, and the Bacteriologist, Dr. N. Kovacs, for their continued assistance in the solution of many problems.

In the investigation of suspected cases of tuberculosis, it was shown again that where sputum is present it is the most likely source of bacteria, while in its absence bronchial lavage is more productive of positive results than fasting gastric contents.

#### PULMONARY FUNCTION LABORATORY

Dr. F. E. Heymanson, as pulmonary physiologist, was consulted regarding a multitude of problems, and his contribution to our understanding of the varied patterns of disability related to tuberculosis and other chest diseases has been most valuable. His advice was sought in problems of diagnosis, management and assessment of patients regarding fitness for surgical treatment, and we are grateful for his co-operation and help at all times.

#### NURSING SERVICE

Under Matron O. Anstey, the previous excellent standard of nursing was maintained, and I am most grateful to Miss Anstey and her senior staff for the excellence of their efforts in supervising nursing care throughout the hospital.

#### ADMINISTRATION

Our thanks are due to the secretary, Mr. A. F. T. Thomson, and his clerical staff, for their co-operation and help throughout the year.

#### REHABILITATION

As a result of early diagnosis by mass radiography and effective treatment with chemotherapy, the majority of patients are rendered fit to resume their previous occupations, and the only problem facing them on discharge is the current labour market, in which employment, particularly for unskilled labourers, is largely unavailable. Our chief concern therefore lies in the establishment of an effective liaison with industry in order to help this type of patient, on completion of his hospital treatment, to find the position which is essential for the maintenance of his morale and the continued control of his disease.

The Tuberculosis Association, through its sheltered workshop, has provided temporary employment for a large number of ex-patients and given them an opportunity, while working part-time, to seek permanent employment in the general labour market, and in this way fulfilled a valuable need for our unskilled patient community.

#### WOMEN'S AUXILIARY

The Women's Auxiliary of the Tuberculosis Association acts as the auxiliary to the hospital. This body of volunteers conducts the hospital canteen which provides an excellent service to patients and visitors, and from the proceeds of the canteen they provide amenities for patients.

Included in their activities were a generous contribution towards four television sets, a monthly donation of £5 for purchase of library books, and the purchase of pictures for the decoration of the wards, and books on art and art therapy.

We are sincerely grateful to them for the service they have rendered to the hospital.

#### VITAL STATISTICS

Total admissions during the year	....	....	....	....	....	....	724
Male	....	....	....	....	....	....	503
Female	....	....	....	....	....	....	221
Of total admissions :—							
Suspect tuberculosis	....	....	....	....	....	....	392
Of suspects :—							
Active, proved bacteriologically	....	....	....	....	....	....	128
Presumed active, bacteriologically negative				....	....	....	53
Tuberculosis inactive	....	....	....	....	....	....	81
Non-Tuberculous	....	....	....	....	....	....	125
Non-Tuberculous diseases (on admission)				....	....	....	332
Total Non-Tuberculous	....	....	....	....	....	....	457



Method of Discovery of Tuberculosis and Suspect Tuberculosis Cases admitted :—

Mass Radiography :

Metropolitan	....	....	....	....	....	....	....	....	4
Country	....	....	....	....	....	....	....	....	31
Metropolitan Practitioners via Chest Clinics	....	....	....	....	....	....	....	....	71
Metropolitan Practitioners via other channels	....	....	....	....	....	....	....	....	4
Country Practitioners via Chest Clinics	....	....	....	....	....	....	....	....	69
Royal Perth Hospital	....	....	....	....	....	....	....	....	15
Other Institutions	....	....	....	....	....	....	....	....	9
Chest Clinics (Routine) :									
Perth	....	....	....	....	....	....	....	....	108
Fremantle	....	....	....	....	....	....	....	....	17
Kalgoorlie	....	....	....	....	....	....	....	....	64

Of the total tuberculosis admissions 89 were “readmissions,” including cases previously treated at Wooroloo and in other tuberculosis institutions. Of these, 37 were regarded as requiring treatment and 52 proved inactive on investigation. Of the 37 cases requiring treatment, 21 were positive on culture of sputum or other material, 13 had a negative sputum, but were presumed active, and three were suffering from disease due to unclassified mycobacteria. The causes of relapse necessitating readmission in these 37 cases were as follows :—

Natural history (no previous chemotherapy)	....	....	....	....	....	....	....	....	8
Natural history (inadequate previous chemotherapy)	....	....	....	....	....	....	....	....	19
Continuation of previous chemotherapy	....	....	....	....	....	....	....	....	1
Chronic progressive “Atypical” tuberculosis	....	....	....	....	....	....	....	....	3
Complications of previous treatment :									
Infected Plomb	....	....	....	....	....	....	....	....	3
Tuberculous empyema	....	....	....	....	....	....	....	....	3

Discharges

Total number of discharges	....	....	....	....	....	....	....	....	726
Tuberculosis after long term therapy (Average length of stay—38 weeks)	....	....	....	....	....	....	....	....	199
Tuberculosis discharged after short-term investigation, or transferred to other institutions	....	....	....	....	....	....	....	....	105
Other Diseases :									
Silicosis	....	....	....	....	....	....	....	....	32
Pneumonia and lung abscess	....	....	....	....	....	....	....	....	85
Bronchiectasis	....	....	....	....	....	....	....	....	54
Bronchitis, emphysema and asthma	....	....	....	....	....	....	....	....	98
Carcinoma of lung (including carcinomatosis)	....	....	....	....	....	....	....	....	78
Sarcoid	....	....	....	....	....	....	....	....	4
Spontaneous pneumothorax	....	....	....	....	....	....	....	....	14
Pulmonary fibrosis (cause not determined)	....	....	....	....	....	....	....	....	13
Miscellaneous	....	....	....	....	....	....	....	....	29
Extrapulmonary Tuberculosis	....	....	....	....	....	....	....	....	11

Only three patients were discharged with a positive sputum. They were all cases of advanced disease excreting drug-resistant organisms, but their home conditions were in all cases completely satisfactory, and they were permitted to go home only after a long period of observation and treatment in hospital.

Irregular Discharges

Nine tuberculous patients absconded or left hospital against advice before the satisfactory completion of their treatment. Of these, two returned and continued their hospital treatment after a short time, and one returned and was transferred to the refractory ward at Wooroloo. In five the disease was regarded as sufficiently controlled to allow cessation of treatment, or continuation of treatment on a domiciliary basis, and in one, a native with cervical glands, no action was taken. In none of the patients allowed to remain at home was the disease considered infectious.

DEATHS

There were in all 35 deaths, but only two of these were directly due to tuberculosis. One was an old case of extensive disease with resistant organisms, and the other was a severe case of miliary tuberculosis complicated by agranulocytosis. Two cases died shortly after admission with active tuberculosis, but the cause of death was myocardial infarction, and five patients had inactive tuberculosis which did not contribute to the cause of their death. Two died of respiratory failure related to old inactive tuberculosis. In 17 the cause of death was bronchogenic carcinoma, and in the other eight death was due to miscellaneous causes. It can thus be seen that tuberculosis is an almost negligible cause of death.

## CONCLUSION

In concluding my report, it is a pleasure to record my appreciation of the sterling services given by all sections of the staff throughout the year. Under a loyal and conscientious group of departmental heads a high standard of efficiency has been maintained in all departments, and the cheerful and friendly atmosphere of the institution has contributed generally to the morale of the patient community.

On the occasion of his transfer from the State Tuberculosis Control Branch to the position of Commonwealth Director of Tuberculosis, it is fitting here to record the grateful appreciation of the staff of the hospital to Dr. Alan King, for his guidance, understanding and sympathetic support in all our problems during the past two years since the hospital opened. We all wish him success in his new position and offer to you, Sir, as his successor, our congratulations and our loyal and wholehearted allegiance.

Finally, I express my appreciation to the Commissioner of Public Health and the Under Secretary and staff of the Public Health Department, for their continued interest and assistance throughout the year.

H. R. ELPHICK, M.B., B.S., M.R.C.P., M.R.A.C.P.,  
Physician Superintendent.



## Appendix V

### PULMONARY FUNCTION LABORATORY

Report by Dr. F. E. Heymanson

#### ROUTINE INVESTIGATIONS AND TREATMENT

##### 1. *Spirometry*

Three hundred and ninety-seven of these investigations were carried out in the course of the year, many of them being duplicated before and after bronchodilation. These duplicate tests are only recorded as a single test for the purpose of the total.

With our increasing experience of this relatively simple investigation, 600 successful tests having been done in this laboratory, its value becomes increasingly evident. The functional pattern obtained for each patient is closely correlated with the thoracic pathology and often directs attention to the possibility of other physiological defects requiring further investigation.

Amongst the great variety of patients passing through our hands have been a number suffering from established or suspected Asbestosis and this condition in particular appears to be associated with a characteristic pattern related to that commonly seen in Sarcoidosis. As the mechanism of physiological disablement in both these conditions is not dissimilar, this is perhaps not surprising.

We have found a further use in a few instances for this procedure in the investigation of the possibility of sensitivity to specific allergens of the respiratory tract. It has been suggested with rather striking evidence in support, that the value of skin testing for sensitivity, so far as the respiratory tract is concerned at least, is merely to indicate the group amongst which the specific allergen or allergens may be found. It is well known that the common finding on skin testing is a large number of positive reactions : if each allergen producing a positive skin reaction is brought in contact with the respiratory tract, and any change which may occur as a result, measured on the Spirometer, the specific allergen can in many cases, be easily incriminated. Our limited experience has in every instance, confirmed this, and it is believed that in appropriate cases this test can be of considerable value.

##### 2. *Gas Exchange*

At the end of 1959 our electronic analyser, used for estimation of the diffusion capacity for carbon monoxide, became unserviceable and it proved impossible to have the machine satisfactorily repaired in Australia. It was therefore returned to the makers in England, and has recently arrived back in our hands. Although the machine is of an unusual character as electronic devices go, I feel that this is a most unfortunate reflection on the repair facilities available at least in this state, in so far as the letter from the manufacturers, accompanying the machine on its return, gave the impression that the fault was both obvious and trivial, and further implied that they were astonished that the machine had had to be returned to them.

In the absence of the analyser, it was decided early in the year to use as a substitute for the diffusion capacity, the oxygen uptake on standard exercise, the results being expressed at the oxygen uptake per minute per square metre of body surface, and also as the volume of respired air required for each 100 c.cs of oxygen uptake (the ventilation equivalent). The difficulty then arose that we required an accurate method for the determination of the percentages of carbon dioxide and oxygen in expired air. The original Scholander gas analyser, which was obtained in England, gave extremely erratic results in our hands, and could not be trusted to give the necessary accuracy. As it was felt that this was in the main, due to lack of experience and technical inadequacy, the Director of Tuberculosis arranged at my request, for me to work at the Hallstrom Institute in Sydney for a fortnight, with a view to attaining an adequate technique. In the outcome there were certain aspects of our technique which were inadequate, but I was informed by Dr. Sinclair-Smith that at the Hallstrom Institute they had had two Scholander machines of the same brand as my own, and they had never succeeded in making them work satisfactorily. While at the Institute every facility was made available to me, and the greater part of my time was spent in carrying out the Institute's routine analysis on their Scholander machine, which was of American manufacture. When I left, a spare American apparatus was given to me on loan, together with certain accessories, which enabled this laboratory to establish a satisfactory analytic procedure immediately on my return and we now possess two American Scholandars of our own. I cannot express myself too strongly concerning the kindness and generous co-operation which my colleagues in Sydney so freely gave.

The Oxygen Uptake Test has been a standard procedure during the greater part of this year and has proved at least from the clinical point of view, extremely satisfactory. Forty-six of these estimations have been successfully completed.

##### 3. *Bronchospirrometry*

Our first attempts at this procedure used the differential gas sampling method developed in Birmingham, with the modification that carbon dioxide excretion rather than oxygen uptake was measured, and the gas analysis carried out by an electronic analyser. We were never completely happy with this technique for both theoretical and practical reasons, and it was ultimately discarded. Since then a most satisfactory technique has been attained, using the double lumen Carlens catheter and two high speed spirometers. On the advice of Dr. Roy Cairns, and in contrast to current practise elsewhere, this procedure has been carried out under general instead of local anaesthesia. This appears to have a number of advantages and although the method has only so far been used twice, on both occasions the results were entirely satisfactory with no unforeseen technical difficulties.

The total recorded bronchospirrometries for the year numbered five.



#### 4. *Estimation of Carbon Dioxide Tension of Arterial Blood*

This procedure has been one of the great lacks of this laboratory in so far as it is a fundamental investigation and we are still without the necessary apparatus for accurate estimation. Its absence is not for want of trying. Earlier in the year we made a determined effort to devise equipment which could be manufactured in the Perth Chest Hospital workshop. Although results were obtainable their variability and the general unreliability of the set-up, brought our efforts to nothing. In another direction, using the mathematical theory of Defares, a number of estimations were made, but the complexity and labour involved made any further progress impracticable.

More recently we have been using a simplified version of the Campbell rebreathing technique, which offers no great difficulty, but although in general the results obtained are sufficient for clinical purposes, the estimation is indirect, and the accuracy quite insufficient for many purposes. As has been mentioned in earlier communications, it is a crippling handicap to be without the means of accurately and routinely estimating arterial carbon dioxide tension. It is recognised that the financial outlay for this laboratory has been generous and not without sympathetic understanding of its needs. Even in the absence of other considerations however, it would not seem economic to radically circumscribe both the range and quality of the work being done for the sake of a sum which in terms of the total investment, is small. Estimations done during the year, the Campbell technique not having been introduced until the present year, were all by the unsatisfactory procedures detailed above and the actual numbers are not recorded.

#### 5. *Estimations of Maximum Working Capacity*

This procedure is sometimes required, more particularly in compensation cases, and has been carried out three times during the year.

#### 6. *Patient Treatment with Inspired Bronchodilator under Positive Pressure*

It was only in the latter part of the year that the number of treatments were individually recorded with separation of both in-patients and out-patients, and the figure for the total treatments given during the year can only be an estimate. It would appear that at least 500 treatments have been given, and probably considerably more.

The positive pressure treatment is given with two purposes in view :—

- (1) To determine the presence or absence of bronchospasm in obstructive disease, spirometric testing being carried out before and after treatment, and
- (2) As a means of maintaining certain patients with chronic pulmonary disease at a higher level of comfort and efficiency than would otherwise be attainable.

The indications for and the mechanism of any results obtained by positive pressure breathing, although understood in part, are not clearly defined.

With regard to the indications, the working rule which we have gradually arrived at, provides for four categories of patients who may obtain significant benefit by regular treatment :—

- (1) Those with marked bronchospasm, which spirometry shows to be considerably relieved by bronchodilator drugs and positive pressure.
- (2) Those with obstructive disease associated with moderate or greater quantities of sputum, which is coughed up only with difficulty. Those without obstructive disease and considerable sputum such as bronchiectasis, do not appear to be benefited.
- (3) Those with obstructive disease associated with hypercapnia.
- (4) Those with obstructive symptoms associated with a raised right atrial pressure, such as may be found in patients with Mitral Stenosis, or Left Ventricular Failure, are commonly benefited to a greater degree than they would be with conventional treatment alone.

These criteria can only be regarded as a rule-of-thumb based on practical experience up to the present, but although we have not subjected our results to any statistical appraisal our impression is that, in appropriate selected cases, the benefit attainable is often worthwhile and occasionally spectacular.

### RESEARCH INVESTIGATIONS

The major investigations as was mentioned in my last Annual Report concern gas exchange. This has so far been almost exclusively a theoretical investigation into the possible mathematical relationships of the multiple factors which operate when oxygen is transferred from the alveolar space to the haemoglobin molecule. A practical equation has been arrived at for determining the mean alveolar-haemoglobin pressure gradient of oxygen which we have shown to give remarkably consistent and accurate results when compared with results obtained from the same data by the conventional Bohr integration procedure. In so far as the latter is a numerical integration and is not based on a relationship derived from basic principles, it is of considerable interest that the close co-relation mentioned above should exist as the equation referred to was arrived at from entirely theoretical principles. There remain, however, certain weaknesses in the theoretical development, which it seems can only be resolved by practical experiment.

The mathematical analysis however, indicated fairly clearly that the nature of the time-saturation curve of the alveolar capillary is significantly different from what has been heretofore believed.

A careful record of our quantitative results has been maintained from the outset with a view to an article in due course, setting forth our ideas on the co-relation of the numerical patterns obtained on ventilatory measurement with the lung pathology, and the manner in which these patterns direct attention to the possibility of other physiological defects, such as impairment of diffusion, variation in compliance, reduced total lung volume and so forth.



THE WOMEN'S AUXILIARY OF THE WESTERN AUSTRALIAN BRANCH OF THE  
TUBERCULOSIS ASSOCIATION

I would like to express my great appreciation to the members of the Auxiliary for their generosity in making available to me the sum of £300 for the purchase of a Brinkman Oximeter. This machine, which determines the degree of oxygen saturation of blood samples, will enable a more practical approach to our current investigation of gas exchange, and will in addition be a most important adjunct to routine investigations for clinical purposes.

I would like to mention, as well as its practical usefulness, the encouragement which this gift has given to persist in our investigations, which it is hoped in the final outcome, will justify such a practical expression of confidence.

CONCLUSION

The help and co-operation which I have received from my colleagues in this hospital and at the Chest Clinic, and also from the Department, has been a great stimulus to the effort to maintain our results at a high level of accuracy, and to the people concerned I wish to express my appreciation, in particular to Dr. Alan King, former Director of Tuberculosis.

(Sgd.) F. E. HEYMANSON,  
Physician.

Appendix VI

REPORT BY THE DIRECTOR OF EPIDEMIOLOGY

From the viewpoint of communicable disease control, 1960 has been a notable year. Not only was there a continued absence of significant poliomyelitis, but diphtheria has virtually disappeared, and not a single indigenous case of typhoid fever occurred. These are pleasing accomplishments which might well reflect a general advance in public health. It is a little over four years since the last great epidemic of poliomyelitis, and it is now evident that systematic Salk vaccination has paid rich dividends. It is difficult to exaggerate the effect of this programme in highlighting the value of immunisation in preserving child health. For over 20 years sustained efforts were made to popularise immunisation against diphtheria, with but limited success. It was left to the Salk Vaccination Programme, with its massive coverage and impressive effect, coupled with the activities of the Health Education Council, to convince the most apathetic that immunisation offered a safeguard, second to none, in protecting the health of children. As a result, an intense demand for all kinds of immunisation has developed, especially against diphtheria, tetanus and whooping cough, and latterly against influenza as well. In consequence, the incidence of diphtheria has diminished rapidly, and during the year under review it reached the lowest level ever recorded in the State. Thus diphtheria, like poliomyelitis, has now ceased to be a public health problem ; and available resources can be diverted elsewhere. The absence of typhoid too, is especially gratifying, for this is the first time since official records of the disease have been kept in the State, that no case of it has been reported in a year (although a person under investigation for an unrelated disease was found to be a typhoid carrier).

The conquest of infectious disease, however, is by no means complete ; and at least one such disease attained epidemic proportions during the year—infective hepatitis. The only safeguards against this infection appear to be hand cleanliness and the passive immunisation of close contacts. These are useful but inadequate measures, and until the causative agent itself has been isolated and a vaccine prepared, control will remain incomplete. The State was spared a frank outbreak of influenza during the year, but the usual spate of mild upper respiratory tract infections occurred during late winter and spring. The dysenteries, diarrhoeas and salmonella infections persisted with undiminished inconvenience. The establishment of a Salmonella Investigation Unit within the Public Health Laboratories has facilitated the investigation of these cases, but adequate control is an elusive ideal which at the moment appears to be unattainable. More field work in this area is necessary before practicable preventive measures can be evolved.

Among the special projects carried out during the year the Zoonosis Study, involving over a thousand personnel in the meat industry, was perhaps the most important. The results are recorded elsewhere in this report and disclose quite significant infection rates in respect of brucellosis and leptospirosis, which require further investigation from the preventive viewpoint. Analysis of data accumulated during a Survey of Home Injuries in General Practice was completed for the College of General Practitioners, and the findings have commanded much interest in other states. Certain institutions sought assistance in controlling hepatitis, and large scale passive immunisation with gamma globulin was undertaken. In July, the potential infectivity of desiccated coconut from Ceylon came under notice again, and regular investigation of this import was resumed, with the co-operation of wholesalers. The outcome is recorded later in the report.

Changes in organisation and administration during the year have resulted in the formal recognition of an Epidemiology Branch of the Department, with a permanent establishment and added commitments. Responsibility for the administration of the trachoma control programme and for supervision of venereal disease control has been assigned to it. These are logical developments which should enhance the effectiveness of the Department in preventing and controlling disease.

POLIOMYELITIS IMMUNISATION

ANNUAL SALK VACCINATIONS

(Since 1/7/56 when Salk Vaccination began)

Year							No. of Separate Injections Given
1956 (July-Dec.)	....	....	....	....	....	....	224,466
1957	....	....	....	....	....	....	415,166
1958	....	....	....	....	....	....	273,017
1959	....	....	....	....	....	....	309,914
1960	....	....	....	....	....	....	140,590
Total	....	....	....	....	....	....	1,363,153



SALK VACCINATION STATUS IN W.A.

Record of Vaccinations from 1/7/56, when Salk Vaccination began, to 31/12/60. Ages adjusted as at 30/6/60

Age Group					Three Injections	Two Injections	One Injection	1, 2 or 3 Injections
0- 4	....	....	....	....	51,753	3,406	2,992	58,151
5- 9	....	....	....	....	64,718	12,888	4,856	82,462
10-14	....	....	....	....	64,235	6,627	968	71,830
Total under 15					180,706	22,921	8,816	212,443
15-19	....	....	....	....	50,208	4,867	1,723	56,798
20 and over	....	....	....	....	180,327	22,347	18,621	221,295
Total over 15					230,535	27,214	20,344	278,093
ALL AGES					411,241	50,135	29,160	490,536

SALK VACCINATIONS, 1960

Age Group					Third Injections	Second Injections	First Injections	Total No. of Separate Injections
0- 4	....	....	....	....	16,282	12,819	13,227	42,328
5- 9	....	....	....	....	2,013	790	751	3,554
10-14	....	....	....	....	469	246	240	955
Total under 15					18,764	13,855	14,218	46,837
15-19	....	....	....	....	4,426	1,362	1,185	6,973
20-24	....	....	....	....	8,453	2,500	2,289	13,242
25-29	....	....	....	....	8,711	2,460	2,216	13,387
30-34	....	....	....	....	9,293	2,342	1,891	13,526
35-39	....	....	....	....	8,682	2,057	1,566	12,305
40-44	....	....	....	....	7,226	1,723	1,272	10,221
45-49	....	....	....	....	6,162	1,495	1,145	8,802
50 and over	....	....	....	....	10,209	2,846	2,242	15,297
Total over 15					63,162	16,785	13,806	93,753
ALL AGES					81,926	30,640	28,024	140,590

POLIOMYELITIS INCIDENCE

(Since Salk Vaccination)

Year							Not Vaccinated		Vaccinated	
							N.P.	P.	N.P.	P.
1956 (July-Dec.)	....	....	....	....	....	....	1	1	....	....
1957	....	....	....	....	....	....	....	3	....	....
1958	....	....	....	....	....	....	....	1	....	....
1959	....	....	....	....	....	....	....	2	....	3*
1960	....	....	....	....	....	....	....	4	....	....
TOTAL							1	11	....	3

\* 2 had received only 1 injection. 1 had received all three.

### *Poliomyelitis Immunisation*

The Poliomyelitis Immunisation Programme was continued during 1960, being focussed mainly on adult vaccination. With the Child Vaccination Phase completed, the main commitment in this age was the continuing intake of new infants. Three times as many injections were administered to adults during the year than to children ; but the overall number of separate injections given during 1960 (140,590) showed a substantial reduction over previous years. The total number of injections administered since the Salk Vaccination Programme began in July, 1956, is shown in the accompanying table ; and it will be seen that approximately 66 per cent. of the State's population have now received one or more injections of Salk vaccine, 55 per cent. having completed the full course of three injections. There is, however, a marked disproportion in the vaccination status of adults as opposed to children. Whereas over 90 per cent. of children in the State have been protected, only a little more than 50 per cent. of adults have Salk vaccination. While the incidence of poliomyelitis remains low, this situation need cause little concern, but if this incidence increases it is not unlikely that an appreciable amount of preventable poliomyelitis could occur among adults ; and efforts to secure more vaccinations among adults are indicated.

The immunisation unit continued its policy of making it as easy as possible for adults to receive injections by running evening or after-work clinics ; but towards the end of the year when Salk vaccine was released to private practitioners in the metropolitan area, the mobile clinics which had previously operated in the metropolitan area were withdrawn. Owing to the practical difficulties of distributing Salk vaccine to country doctors, however, mobile units were maintained in country areas.

Four cases of poliomyelitis were confirmed during 1960. All were paralytic and none had been vaccinated. Altogether, since Salk vaccination began in 1956, 15 cases of poliomyelitis only have been recorded, and of this number 12 have been in unvaccinated people. The effect of Salk vaccination is obvious.

By the end of 1960, 1,363,153 separate injections of Salk vaccine had been administered in Western Australia, and this preparation has proved to be one of the most trouble-free immunising agents ever used. Nevertheless, a few disturbing reactions and sequelae were observed and these were reported in detail in the Medical Journal of Australia on 3rd December, 1960.

### *Typhoid*

One of the most notable and gratifying observations of the year was the virtual absence of typhoid fever. Only two instances of this infection were encountered during 1960. One was a convalescent carrier, who contracted his infection abroad ; while the other was identified as a chronic carrier during routine investigation in hospital for an unrelated disease. For the first time on record, however, not a single indigenous case of acute typhoid fever was notified during the year, and this might be considered as something of a highlight in the record of communicable disease control in the State. It would seem that the intensive search for sources of infection and the increasing detection and surveillance of carriers are partly responsible for this satisfactory state of affairs ; but it is at least tempting to speculate whether reduced beach pollution may have contributed to it.

### *Diphtheria*

Diphtheria provided yet another outstanding illustration in the control of communicable disease during the year ; for its incidence (five cases only) was the lowest ever recorded. Although it has long been known that the only effective answer to this infection is infant immunisation, painstaking efforts to educate mothers in this direction produced disheartening results until comparatively recently. It was probably the advent of the Salk Vaccination Campaign in 1956, assisted by the activities of the Health Education Council, which brought the advantages of immunisation clearly before the minds of many parents. Providing that the popularity of triple antigen (and its probable successor, quadruple vaccine) is maintained ; and providing that the energetic education of parents is continued, there is no reason why there should be any resurgence of this disease.

### *Residentships in Preventive Medicine*

During December four newly graduated doctors awaiting hospital appointments were employed as temporary medical officers within the Public Health Department. This was an experiment which had been tried with success in the previous year, and proved equally useful in 1960. One of the doctors was assigned to the task of helping to bring the Cancer Register up to date. Two were asked to assemble as much information as possible on the incidence and epidemiology of diabetes in the State ; and the fourth was asked to complete follow-up examinations arising out of the Zoonosis Study.

### *Desiccated Coconut*

In 1953 an association between typhoid and desiccated coconut in the Eastern States led to the investigation in Western Australia, of desiccated coconut from both Papua and Ceylon. At that time salmonellae were not recovered from Ceylon coconut, but 30 out of 137 samples of Papuan coconut were found to contain these organisms (one of the positive samples contained *s. nyborg*, the 29 others containing *s. senftenberg*). As a result, a large quantity of Papuan coconut was condemned and destroyed, and importation of coconut from that source ceased, although coconut from Ceylon and the Philippines continued to be retailed without interference.

In July, 1960, a report was received from South Australia to the effect that *sh. flexneri* had been isolated from Ceylon coconut. It was part of a shipment, some of which had previously been unloaded for distribution within Western Australia. The bags included in this consignment were immediately traced and 67 samples were examined, of which six disclosed salmonellae. The related bags were condemned and



destroyed, but the remainder was released. In consequence, the following policy was adopted. All subsequent consignments of desiccated coconut would henceforward be subjected to bacteriological examination ; about two to three ounces being taken in sterile glass jars from 10 per cent. of all bags in each consignment. In accordance with this policy, during the nine months commencing July 1, 1960, 14 shipments representing 2,809 bags were sampled ; and 38 (10 per cent.) of the 381 samples contained salmonellae. Of the 38 positive samples, two sero-types were isolated from each of five samples, the remainder yielding only one sero-type. Altogether, 14 distinct sero-types were isolated, their frequency being as follows :—

(1) s. waycross	....	....	....	....	....	9
(2) s. bareilly	....	....	....	....	....	8
(3) s. newport	....	....	....	....	....	5
(4) s. thompson	....	....	....	....	....	4
(5) s. hvittingfoss	....	....	....	....	....	3
(6) s. typhi-murium	....	....	....	....	....	2
(7) s. para-typhi B	....	....	....	....	....	2
(8) s. kotte	....	....	....	....	....	2
(9) s. java	....	....	....	....	....	2
(10) s. nchanga	....	....	....	....	....	2
(11) s. solna	....	....	....	....	....	1
(12) s. butantan	....	....	....	....	....	1
(13) s. rubislaw	....	....	....	....	....	1
(14) s. senftenberg	....	....	....	....	....	1
						—
						43
						—

During the same period seven shipments from the Philippines were also tested, but none disclosed salmonellae.

The measure of this hazard to the public is not easy to assess, but the situation warrants continued investigation and surveillance until remedial action is taken in the country of origin.

Trachoma

Administrative responsibility for the Trachoma Control Programme was assigned to the Branch early in the year. Up to that time the Trachoma Control Programme had been conducted by a more or less detached unit comprising a part-time ophthalmologist and a variable number of nurses.

The trachoma problem in this State had been defined by Dr. I. Mann as a result of three ophthalmic surveys which had covered most of the State (North-West 1953, Eastern Goldfields 1954, and South-West 1955). These surveys had involved 10,647 persons of whom about half were aboriginal ; and had disclosed a very wide range of ophthalmic abnormalities, the most outstanding being trachoma. This disease accounted for about two-thirds of the disorders seen. Its basic pattern appeared to be as follows :—

- (1) The overall incidence was 30 per cent. (3,236 out of the 10,647 examined showing evidence of trachoma in one stage or another).
- (2) It was essentially a disease of the coloured section of the community. The incidence among whites was less than 4 per cent. (204 out of 5,455), while among the coloured it was 58 per cent. (3,032 out of 5,192).
- (3) About 50 per cent. (1,630 out of 3,236) of the trachoma seen was in an active, presumably infectious stage, the remainder being regarded as healed.
- (4) All age groups were involved, but about 58 per cent. of all forms of trachoma occurred under the age of 20 : and this age group accounted for over 92 per cent. of all the active cases seen.

Trachoma in Western Australia was therefore disclosed as a public health problem involving essentially the coloured person under the age of 20 years in most of the State.

The resultant Trachoma Control Programme had been developed over the course of the three preceding years on the following lines :—

- (1) Education of nurses, welfare officers, teachers, missionaries, pastoralists, and the public generally.
- (2) Therapeutic trials involving sulphonamide preparations and anti-biotic eye ointment and combinations of these.
- (3) Travelling nurses trained in the recognition of trachoma and assigned the responsibility of visiting outlying areas and arranging treatment.
- (4) The attempted mass or blanket treatment of groups of natives in various parts of the State by missionaries and station managers.
- (5) The routine treatment of coloured children by school teachers at the outset of the school year.

The outcome of these efforts during the period 1957–1959 was difficult to evaluate, but it was clear that many aspects of it were extremely disappointing and that the incidence of active trachoma was still high in many areas. During 1959 a trial had been conducted with sulfa-methoxy-pyridazine (a long-acting sulphonamide administered in a single daily dose) and this had later been adopted as the standard treatment in a dosage of seven grammes spread over a period of 12 days.

At the outset of 1960 the main feature of attempted trachoma control was the routine treatment of coloured school children commencing school. By the end of March, some 50,000 tablets had been issued to over a hundred schools for the treatment of about 4,000 children ; while 30,000 tablets had gone to



28 missions for a further 2,000 children. In all, therefore, arrangements had been made for the treatment of approximately 6,000 children. Two dangerous reactions occurred ; and subsequent enquiries revealed various side-effects which indicated a need for a reduction in dosage.

The entire problem was therefore reviewed and the following revisions were decided :—

- (1) Only persons with clinical evidence of active trachoma should be treated. Blanket treatment would be permissible only in very special circumstances.
- (2) The dosage of sulfa-methoxy-pyridazine would be reduced to 1·5 grammes spread over a period of five days for school age children ; and the effects observed over the course of six months.
- (3) Treatment for all cases would be carried out under medical surveillance.

During the latter part of the year a systematic detection-treatment campaign in the southern part of the State was organised. High incidence zones were identified and visited in sequence ; appropriate teams remaining in each zone until treatment had been completed in collaboration with the local medical officer of health. By the end of the year there were indications that the revised dosage was inadequate and that further therapeutic trials were needed before a safe, effective and convenient form of treatment could be determined. These are now in progress and involve a school-child dosage of three grammes over five days. Results will be clear in a few months time and if satisfactory, will simplify the control programme.

*Venereal Disease*

A total of 93 venereal infections were reported during the year, representing a slight increase over the previous year. Reference to the accompanying table, however, reveals a conspicuous decline in the incidence of venereal infections in this State during the last three years. The reasons for this are not clear, but it is interesting that the brothel area of Perth was abolished about two years ago. The decline of venereal diseases in Western Australia is in contrast to the trend in certain other States and other countries ; and it was because of this, together with some indications that the gonococcus was developing resistance to penicillin, that an interstate conference on venereal disease was convened in Melbourne during August. As a result of this conference, a number of recommendations have been made. They include the wider use of laboratory aids in precise diagnosis (including sensitivity testing of gonococci), research into the main causes of non-specific urethritis, intensification in the search for sources of infection, and standardisation of equipment.

Year	Syphilis (all types)	Gonorrhoea	Granuloma	Chaneroid	Total
1951	66	261	10	1	338
1952	39	173	4	2	218
1953	43	189	2	1	235
1954	21	188	1	2	212
1955	14	188	1	0	203
1956	12	188	0	0	200
1957	14	217	1	0	232
1958	5	148	0	1	154
1959	8	72	0	1	81
1960	6	87	0	0	93

*Zoonosis Study*

During 1960, in accordance with the recommendation of the National Health and Medical Research Council, a Zoonosis Study was carried out within the meat industry in Western Australia. Its purpose was to determine the extent of unrecognised disease and unsuspected infection contracted occupationally from animals. Three conditions were specifically investigated—Brucellosis (*brucella abortus*), Leptospirosis (*leptospira pomona*), and Q Fever. The survey involved seven slaughtering and meat processing establishments, which together deal with over a million animals each year (approximately 75 per cent. of these being sheep, 15 per cent. pigs and 10 per cent. cattle). The 1,026 men investigated were divided into four categories in accordance with their degree of contact with the animals concerned. Detailed occupational and medical histories were listed and venous blood samples were taken for serological examination. Men found to have significant titres were reinterrogated, medically examined, and subjected to a second serological test.

The essential findings arising out of this study are evident in the tables which follow. In brief, the extent of occupational infection which was revealed by it was considerable. No less than 275 (approximately 27 per cent.) of the 1,026 persons examined showed some serological indication of infection with one or other of the three organisms generally associated with animals. In the majority of instances the anti-bodies detected were in relatively low titre, and the associated infections are not likely to have been accompanied by frank illness. In 88 cases, however, (about 9 per cent. of all sera tested) the titres found were relatively high, and of an order commonly associated with past or present disease. The numbers involved are much in excess of official notifications ; and it is probable that the wider use of laboratory aids in the investigation of fevers among meat workers will lead to a better recognition of these infections. It is a very difficult problem to reduce the occupational hazard involved, but measures such as the use of medicated hand creams warrant trial.



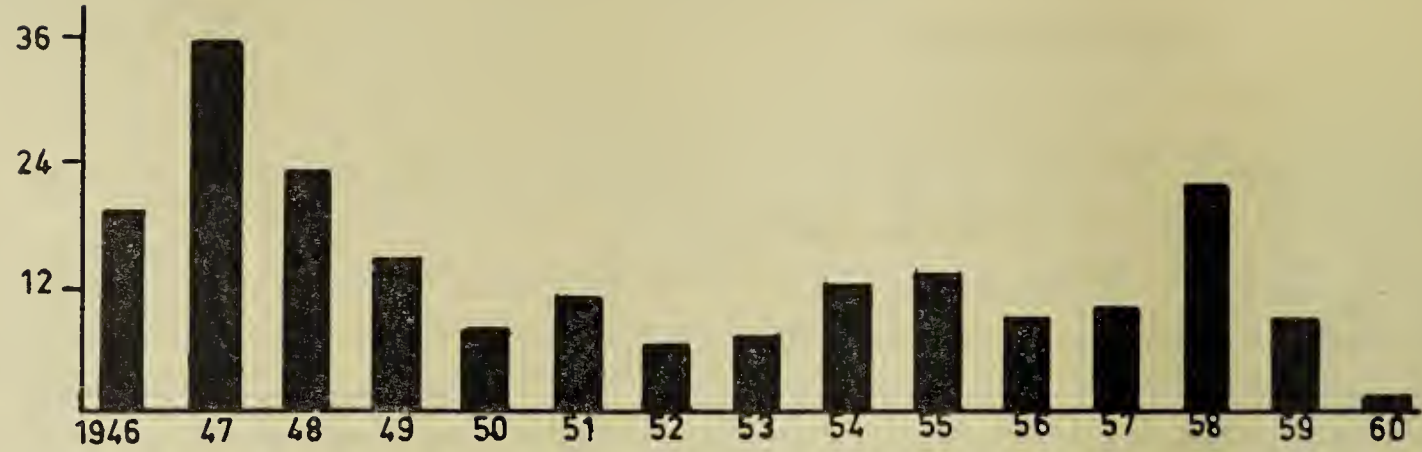
The serological findings in relation to the nature of occupational contact with animals were as follows :—

Occupational Category	Number Examined	Number with Serological Evidence of one or other Infection
Persons employed at meat establishments but not in direct or constant contact with animals ....	85	7 (8·2%)
Persons in direct or constant contact with live animals prior to slaughter, or with carcasses or by-products ....	941	268 (28·5%)
(a) Associated with live animals ....	97	24 (24·7%)
(b) Associated with carcasses ....	416	145 (34·8%)
(c) Associated with by-products ....	428	99 (23·1%)
ALL PERSONNEL ....	1,026	275 (26·8%)

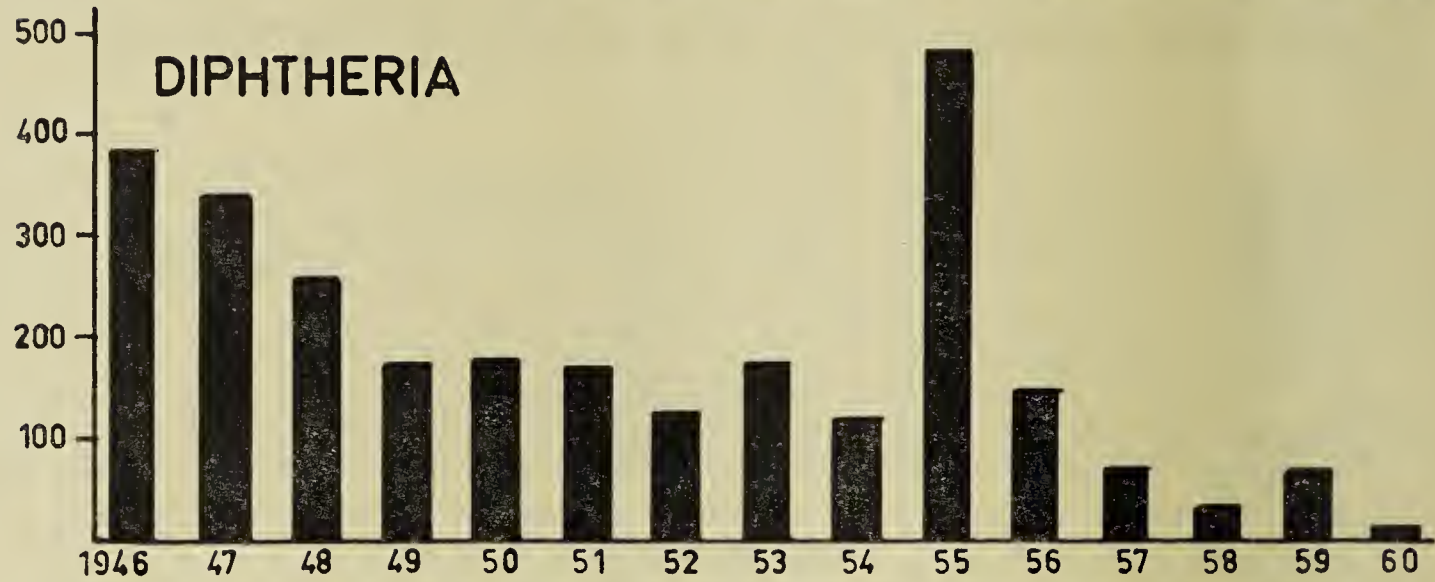
The precise serological titres detected in respect of the three conditions investigated were as follows :—

<i>Brucella abortus</i>										
1 in 640	....	....	....	....	....	6	} 51 (4·8%)	} 138 (13·5%)		
1 in 320	....	....	....	....	....	9				
1 in 160	....	....	....	....	....	14				
1 in 80	....	....	....	....	....	22				
1 in 40	....	....	....	....	....	36				
1 in 20	....	....	....	....	....	51				
0	....	....	....	....	....	888				
All sera	....	....	....	....	....	1,026				
<i>Leptospira pomona</i>										
1 in 1,000	....	....	....	....	....	1	} 28 (2·7%)	} 68 (6·6%)		
1 in 300	....	....	....	....	....	3				
1 in 100	....	....	....	....	....	24				
1 in 30	....	....	....	....	....	26				
1 in 10	....	....	....	....	....	14				
0	....	....	....	....	....	958				
All sera	....	....	....	....	....	1,026				
<i>Coxiella burneti</i>										
1 in 256	....	....	....	....	....	0	} 9 (0·9%)	} 69 (6·7%)		
1 in 128	....	....	....	....	....	3				
1 in 64	....	....	....	....	....	6				
1 in 8	....	....	....	....	....	60				
0	....	....	....	....	....	957				
All sera	....	....	....	....	....	1,026				

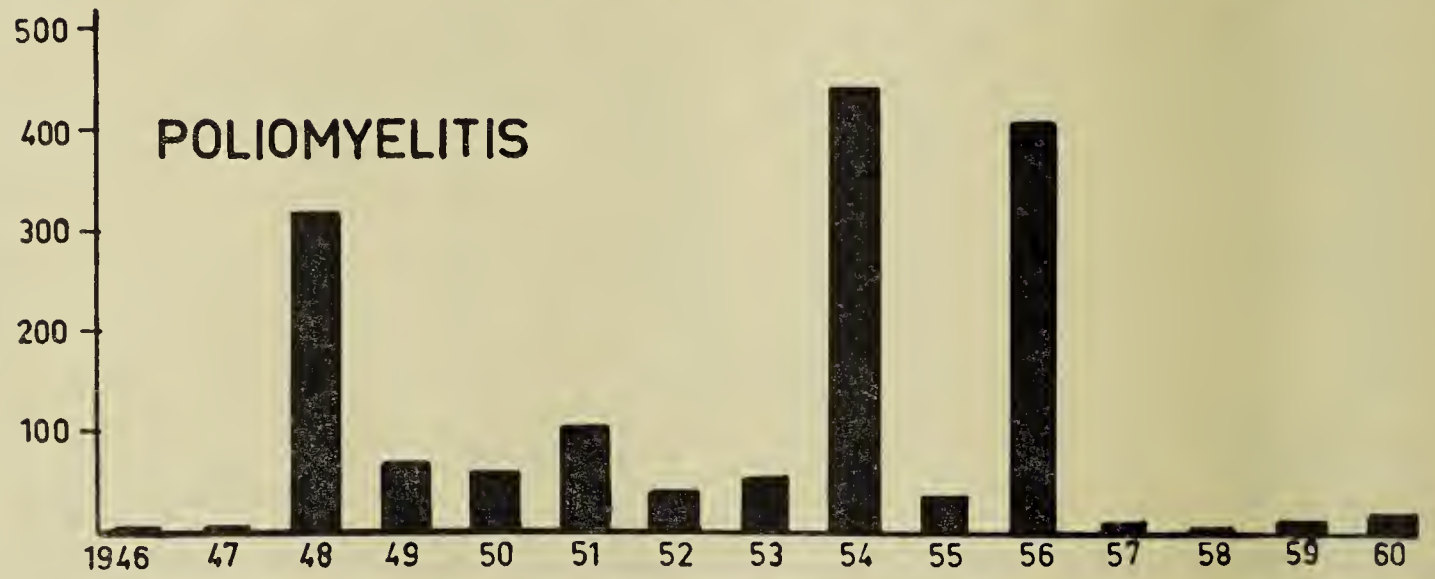
**TYPHOID**



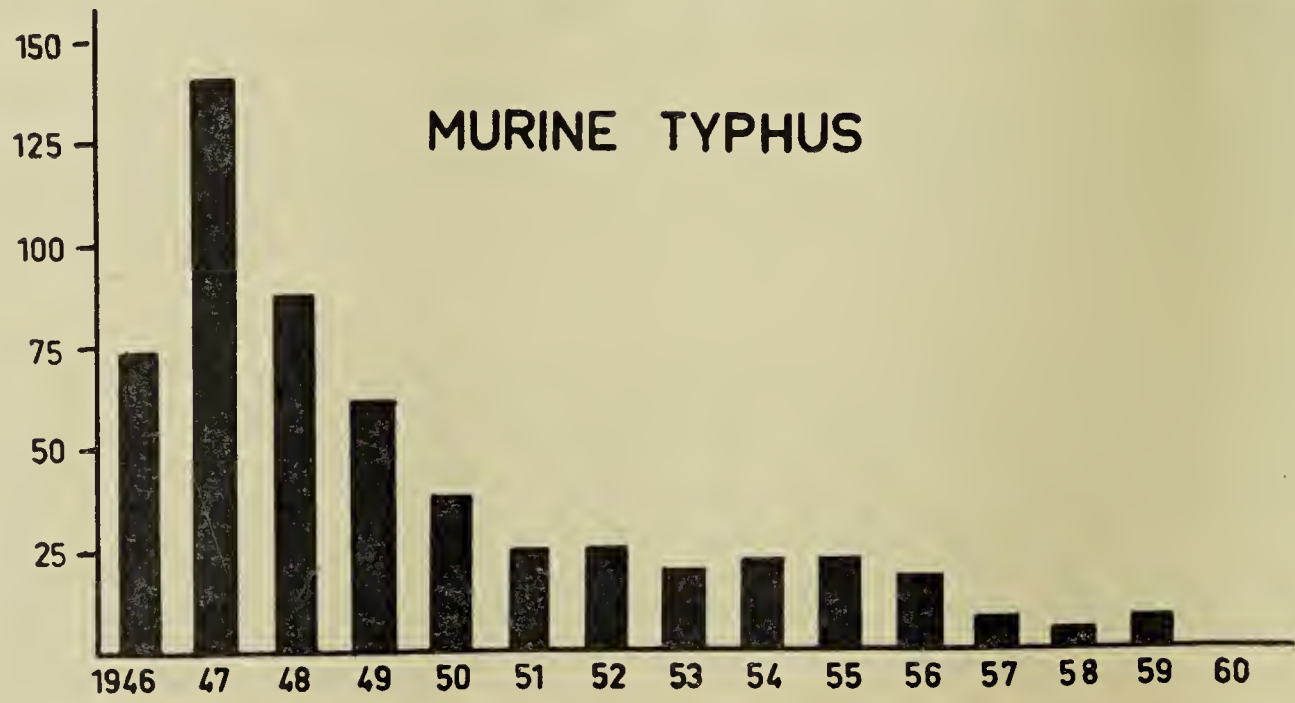
**DIPHTHERIA**



**POLIOMYELITIS**

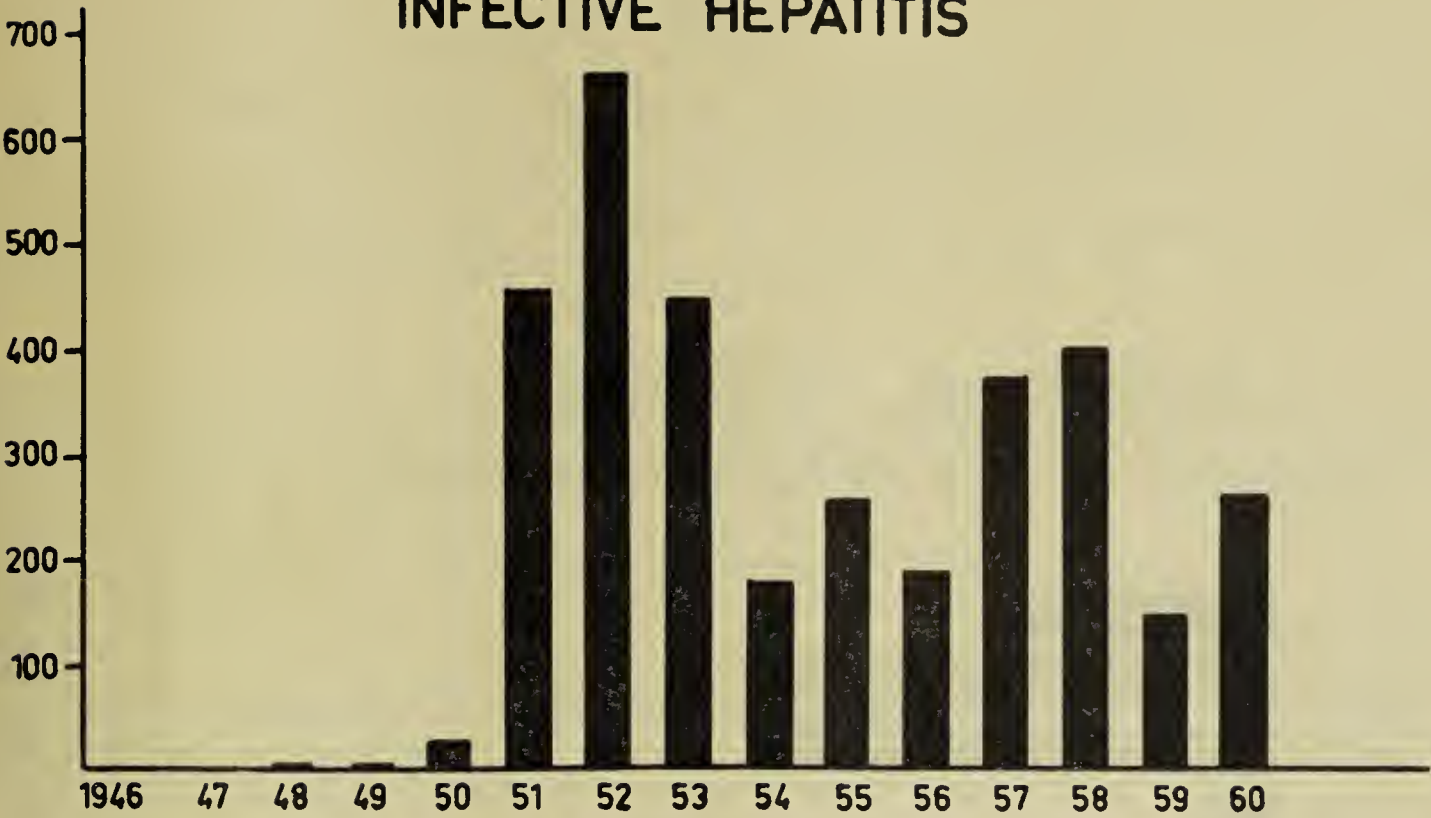


**MURINE TYPHUS**





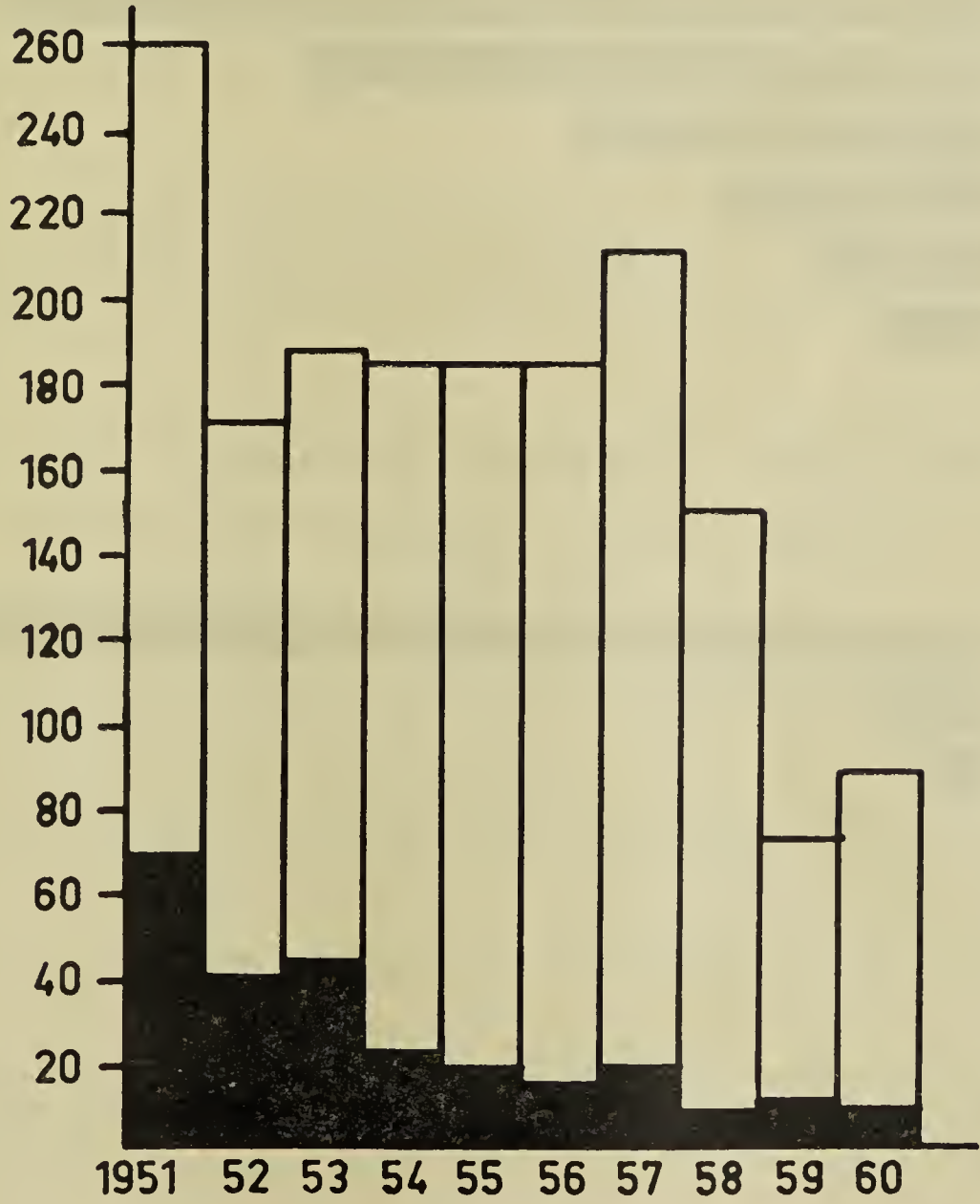
INFECTIVE HEPATITIS



GONORRHOEA



SYPHILIS





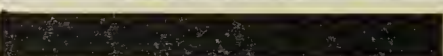



### LEPTOSPIROSIS (L. pomona)

(Agglutinin titres in 68 symptomless persons)

1 in 10		14
1 in 30		26
1 in 100		24
1 in 300		3
1 in 1000		1

### BRUCELLOSIS (Br. abortus)

(Agglutinin titres in 138 symptomless persons)

1 in 20		51
1 in 40		36
1 in 80		22
1 in 160		14
1 in 320		9
1 in 640		6

### Q FEVER (coxiella burneti)

("c.f" antibody titres in 69 symptomless persons)

1 in 8		60
1 in 64		6
1 in 128		3



## Appendix VII

### REPORT ON HEALTH OF KIMBERLEY NATIVES

The subject of this report is the health of the natives, aborigines and part-aborigines, living in the Kimberley Division of Western Australia.

#### INTRODUCTION

The number of natives in the Kimberley Division is not accurately known, because natives were not included in the population census until this year. The probable figure is estimated at five or six thousand, or roughly the equivalent of the white population of Boulder or Busselton. The white population of the Division was 4,585 at the last census.\*

The medical examination of 6,000 natives does not convey the impression of a very arduous task, but local conditions make it time-consuming out of proportion to the actual numbers involved.

The principal difficulty is that the natives are scattered over a wide area. The size of the Kimberley Division is about 139,000 square miles, or slightly larger than the British Isles or half as large again as the State of Victoria. Throughout this area, the natives live in small groups in, and around, some 80 cattle stations, sheep stations and missions. The area also includes the towns of Derby, Broome, Wyndham, Fitzroy Crossing and Hall's Creek, all of which have sizable native populations.

Road communications in the Division are still poorly developed, apart from the Highway connecting Broome, Derby, Fitzroy Crossing, Hall's Creek and Wyndham. During the wet season from December to March, road travel is unreliable and medical inspections have to be confined to the towns and short visits by air to those stations and missions where there are all-weather air-strips.

From April to August the weather is fairly cool and dry and travelling conditions ideal. For this very reason, it is the cattle mustering and shipping season and very few stockmen are available for routine medical examination at this time.

It has been found that, on a single visit to any cattle station, one is seldom lucky enough to be able to examine more than two-thirds of the native employees and dependents and, therefore, several visits are usually necessary. There are always some natives mustering, fencing or working on a windmill miles from the homestead, and the most co-operative station manager cannot do much about it. At a second visit, perhaps months later, one may see those who were missed the first time but it is quite likely that they will have moved to another station or migrated to the other side of Kimberley.

Keeping medical record cards for natives has presented another problem. The aboriginal names are capable of many different spellings according to how they sound to different people. Their English names alone are of no value for identification. For instance, my records already contain 29 "Rosies" and 31 "Charlies".

Whenever possible, it was arranged that my tours should coincide with those of a Native Welfare Department Patrol Officer. Apart from the lessened risk in case of illness or mechanical breakdown, these officers were of great assistance in eliciting aboriginal names and establishing family relationships for identification purposes. Another useful result of this co-operation was that, together, we were able to settle many Pension problems on the spot.

\* Abstract of Statistics of Local Govt. Areas, 1960. Commonwealth Bureau of Census and Statistics.

During the past 2½ years, with unavoidable breaks for other medical duties, clinical records have been made for over 4,000 natives.

#### NUTRITION

If Kimberley natives were ever under-nourished in recent years, the tendency is now in the opposite direction.

Except for the school-age children, the active stockmen and the very aged, the majority of natives seen at a cattle or sheep station are over-weight and many are grossly fat. Especially afflicted are women employed at the homesteads, between 20 and 50 years of age.

Young native stockmen are seldom over-weight because their work is strenuous and a continually-moving mustering camp can provide only an adequate, but not over-abundant, diet. When not mustering stock, these men are engaged on fence and yard building, other occupations where energy expenditure is high.

Obesity is now the commonest, and almost the only, disorder of nutrition found in Kimberley natives. The cause is the obvious one of overeating and under-exertion. Except for the stockmen, the station native's life is easy and food is abundant.

The habit of overeating is presumably a relic of the days when the nomadic native lived mainly by hunting and was obliged to gorge after a successful hunt to tide him over until the next kill. Although he can now be sure of his next meal, the instinct to gorge is still there. If the food on one station is not sufficient, he will soon move on to another.



There is no question today of a station, or mission, adhering to a fixed minimum balanced ration of meat, bread, sugar, tea, salt, etc., containing the necessary number of calories for persons doing certain grades of work. Although the meat ration is usually large, it is probable that the carbohydrates are proportionately excessive. The native is very fond of very sweet tea, sweet biscuits, soft drinks and canned fruits. Many stations grow their own vegetables during part of the year and the native employees get their share.

The town native does not eat as well as the station native. He has to buy his meat, bread is dear and there are no locally-grown vegetables. Nevertheless, I have not recently seen malnutrition or vitamin deficiency except in one mentally deranged native.

Although statistics do not exist to prove or disprove it, the impression is strong that one encounters now, much more often than in the past, those diseases commonly associated with obesity—hypertension, dyspnoea on effort, backache and arthritis of hips and knees, varicose veins and diabetes. One is called upon more frequently to assist a fat, flabby native woman who is having difficulty in giving birth to an oversized baby. Certainly, the easy, almost casual, childbirth traditionally associated with native women, is no longer the rule. Dr. L. J. Holman of Derby believes that the native female's bony pelvis is adequate for the small foetus of a mother living on natural bush food, but too small for the larger foetus of a mother living on White Man's food.

## LEPROSY

### *Incidence*

Leprosy in the Kimberley Division is still almost entirely confined to the native population (aborigine and part-aborigine).

The present incidence of the disease in the native population is certainly over 8 per cent., and is probably between 10 per cent. and 12 per cent. Whether this figure is more or less than in the past is impossible to determine from the old records.

In Derby Leprosarium there were 159 patients on 31st December, 1960. In addition to those, there were 325 natives, scattered throughout Kimberley, who showed clinical signs of inactive leprosy. Most of the latter had been discharged from the Leprosarium after a course of treatment and were under surveillance. There were therefore 484 known cases of leprosy in the Kimberley Division at the end of 1960.

A true comparison with the number of known cases in previous years is not possible because there are reliable records only of those who were admitted to the Leprosarium. Cases with minimal lesions or apparently arrested disease must have been detected from time to time but not admitted to the Leprosarium for treatment. Many such cases are included in the figure for 1960.

In the past, the number of new cases detected probably depended more on the amount of time District Medical Officers could devote to searching for them than on any other factor. If more new cases are being found now, it does not mean that the disease is spreading.

### *Re-admissions to Leprosarium*

Of the 43 patients admitted to the Leprosarium during 1960, 23 had been treated in the Leprosarium before. The proportion of re-admissions appeared to be disappointingly large until analysis showed that there was no cause for disquiet. Three of the re-admissions were neural cases who merely required local treatment of trophic lesions. Nearly all of the remaining 20 had been treated by the earlier, and less effective, preparations of Sulphone and none had received a full course of the more effective drugs at present in use.

### *Surveillance of Leprosy Out-Patients*

Before 1952, the surveillance of discharged Leprosarium patients was not a big problem, because there were only a few discharges. From 1938 to 1951, only 107 patients were discharged. From 1952 to 1959, the average number discharged every year was 47. Modern drugs have, by their efficacy, created the problem of after-discharge surveillance. A discharged patient should be examined at least every six months for several years.

Under the Health Act (Section 251) a person with Leprosy can be ordered to have a medical examination periodically, but only the exceptional native is sufficiently educated and socially responsible to co-operate in this. In practice, it is entirely up to the doctor, usually with the help of the Native Welfare Department, to find the patient and examine him. No assistance whatever can be expected from the native himself in this game of hide-and-seek. He can evade medical examination for a long time, his disease may relapse and become infectious, but he can still find employment and even use public transport. Kimberley employers seldom enquire into a native's medical history before hiring him, or her.

For the eradication of Leprosy, it is necessary to devise a reliable system of recording, if not controlling, the movements of natives under surveillance.

## HOOKWORM DISEASE

Ankylostomiasis is by far the commonest cause of anaemia in Kimberley natives. The infecting nematode is *A. duodenale*. The hookworm endemic areas are the missions at Beagle Bay (200 natives), Kalumburu (200 natives), Forrest River (120 natives) and Wyndham Ration Camp (about 80 natives). Approximately 10 per cent. of all the natives in Kimberley live in the endemic area.



There is a good deal of native movement between Forrest River Mission and Wyndham. Most of the hookworm cases treated at Wyndham during the past two years had recently lived at the Mission. Between Beagle Bay and Broome, natives also move freely, but, fortunately, at Broome the soil of the native encampments on the sandhills is too dry for the development of hookworm larvae. Kalumburu Mission is more isolated and few natives leave the Mission except to go to hospital by air.

So far, hookworm has not spread along the Ord River from Wyndham nor is it found in the valley of the Fitzroy.

In Derby in 1960, one native child living on the edge of the marsh near the town was found to be suffering from hookworm anaemia.

So far, hookworm infection has been found only in the native population of Kimberley. If it were to occur among white persons, its spread would be very unlikely owing to their higher standards of personal hygiene. The natives could be equally free of the disease if they observed the most elementary principles of sanitation. Adequate sanitary conveniences have been provided in all the endemic areas but the natives do not appreciate the importance of using them. It is the native child of pre-school age, defecating wherever he happens to be, who is the principal disseminator of hookworm ova and, from day-long contact with the infected soil, the chief sufferer from the disease. Very few native mothers make any attempt to train their children in good sanitary habits.

#### *The Hookworm Endemic Areas*

*Forrest River Mission.*—In 1959, most of the children at this mission were passing hookworm ova in the faeces, and many were moderately anaemic. The infection was kept within bounds by “blanket” anthelmintic treatment periodically, and Iron therapy where indicated, but was never eradicated.

In September 1960, at Wyndham, several severely anaemic children were found, belonging to two families who had recently migrated from the Mission. Presumably, the diet at Wyndham, less abundant than at the Mission, was insufficient to make good the blood loss caused by the hookworm infection. Also, regular deworming was not then the practice at Wyndham as it was at the Mission. The 200 natives at the Mission were re-examined at this time but no more cases of anaemia were detected.

On re-examination of the natives at this Mission it was found that the population had been reduced to 120 by the departure of several employable natives and their families. There were no cases of anaemia detectable on clinical examination, but the hookworm was merely being kept under control by regular, three-monthly blanket treatment with “Alcopar”.

The lavatory facilities at this Mission are quite adequate if they were properly used.

*Wyndham Ration Camp.*—Most of the permanent native residents of Wyndham live at the Ration Camp at the 3-mile peg, a barren, rock-strewn flat of red, sandy soil. The camp is a natural meeting place for natives from cattle stations on the lower Ord and Dunham Rivers and from Forrest River Mission. Patients discharged from Wyndham and Derby Hospitals often wait at the camp for transport to their stations. Any infection in the camp could therefore be broadcast over a wide area.

Since September 1960, when, as previously mentioned, several severely anaemic children were found at the camp, the Matron of Wyndham Native Hospital has regularly de-wormed all the natives. Nevertheless, six months later, Dr. Buckler of Wyndham found that several children were still anaemic and were passing hookworm ova. The haemoglobin values of 21 children were estimated. Fourteen had values of 10 grams, six of 8 or 9 grams, and one of only 5·7 grams. When I re-examined the 70 natives in the camp recently, there were still five slightly anaemic children under treatment.

*Beagle Bay Mission.*—According to former members of mission staff, Beagle Bay was, at one time, very heavily infected with hookworm. When I examined all the natives here in August 1960, no cases of anaemia were found and representative samples of faeces revealed no hookworm ova. Indeed, it seemed possible that hookworm had been eradicated.

Recently, after an unusually high rainfall of about 45 inches, Dr. Wilmot of Broome found several children suffering from hookworm anaemia. Two months later, re-examination of every native failed to reveal any further cases.

It was reported from this Mission that the frightening hookworm posters issued by the Health Department had had a very favourable effect on the sanitary habits of the natives.

*Kalumburu Mission.*—In July 1959, there were 130 adult natives and about 70 children at this Mission. All the children were passing hookworm ova, and about one-third of them showed slight to moderate anaemia. Two small children who died about this time from respiratory infections had haemoglobin values below 4 grams.

Since 1959, the Mission has adopted a more energetic programme of periodic de-worming, rough haemoglobin estimations by the Sister, and Iron therapy when indicated. The last survey revealed no serious cases of anaemia.

The old village of native huts, on moist ground near the King Edward River, was an ideal breeding ground for hookworm larvae. Soon the natives will move to new houses which have been built on drier soil. Every house has its own lavatory, so that it will be possible to detect the families with insanitary habits and educate them.

#### TRACHOMA

The incidence of active trachoma in native children in the Kimberley Division was almost spectacularly decreased after the mass treatment campaign with Sulphadimidine in April 1959. Station managers and Mission Superintendents co-operated conscientiously in administering the drug to all native children at the same time, thus diminishing the risk of untreated children re-infecting the others.

Since 1959, active cases have been treated as they were discovered, but no "blanket" treatment has been given. The reason for this was the difficulty in determining a dosage which was both safe and effective for "Lederkyne", a long acting Sulphonamide, which is now the drug of choice. It is thought that this problem has now been solved.

The present position is that trachoma is again widespread among native children on stations and missions and another mass treatment campaign will be necessary to bring it again under control. In the towns, active cases are detected earlier through more frequent medical examination of children. Some cattle stations with from 100 to 200 natives may require the services of a nursing sister to ensure that treatment is given systematically and effectively.

#### GRANULOMA INGUINALE

Twelve years ago, this disease was very common throughout the Kimberley Division. It is now very uncommon. Since 1959, only two cases have been treated at Derby Native Hospital and a third at Kalumburu Mission. Presumably this welcome change has resulted from the natives seeking treatment, with antibiotics, at an earlier stage.

#### YAWS

In the adult native population there is a high incidence of the bony lesions of Late Yaws, the most obvious clinically being the "Sabre Tibiae". This indicates that Yaws was very prevalent up to, perhaps, a decade or more ago, and the high incidence of positive Wassermann and Klein reactions supports this. The absence of local facilities for detection of spirochaetes by dark-ground examination makes it difficult to be certain how common Primary Yaws is now, but my impression is that most of the skin lesions superficially bearing a certain resemblance to Yaws are, in fact, no more than pyogenic infections. It is hoped that more light will be thrown on this problem by the better facilities for examining scrapings expected soon at the Public Health Laboratory at Derby.

#### TORULOSIS

Two cases of meningitis caused by *Torula histolytica* (*Cryptococcus neoformans*) were admitted to Derby hospitals recently. Both were fatal.

The records also show one case in 1954, one in 1957, still alive after lobectomy for a toruloma accidentally discovered, and one case in 1958.

It may, of course, be no more than coincidence that four of these cases occurred at places within a radius of 50 miles, namely Gordon Downs, Nicholson Station, Turner River Station and Flora Valley. The fifth case, the toruloma of lung, occurred at Wyndham.

At present, Torulosis must be seriously considered in the differential diagnosis of any nervous case from this area.

J. J. ELPHINSTONE, M.D.,  
Aberdeen.



Appendix VIII  
DERBY LEPROSARIUM  
WESTERN AUSTRALIA

Admissions and Discharges for the Year 1960, compiled from the Monthly Returns of the Superintendent

Month of Year 1960		Admissions					Discharges							Inmates Remaining in Leprosarium							
		Males			Females		Males				Females			Total Dis- charged	Males	Females	Total Remain- ing				
		Ad- mitted	Re-Ad- mitted	Total Males	Ad- mitted	Re-Ad- mitted	Total Females	Dis- charged Cured	De- ceased	Ab- sconded	Dis- charged Non-In- fectious	Total Males Dis- charged	Dis- charged Cured					De- ceased	Ab- sconded	Dis- charged Non-In- fectious	Total Females Dis- charged
January	...	1	...	1	3	4	2	...	...	...	2	...	...	...	...	...	79	49	128		
February	...	1	3	4	...	1	1	...	...	...	1	...	...	...	...	...	79	50	129		
March	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	82	50	132		
April	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	82	52	134		
May	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	82	52	134		
June	...	1	5	6	3	...	...	...	...	...	...	2	...	...	...	2	88	53	141		
July	...	1	1	2	...	...	2	...	...	...	...	...	...	...	...	...	90	53	143		
August	...	...	2	2	1	...	2	1	...	...	3	...	...	...	...	...	89	54	143		
September	...	...	4	4	2	4	...	1	...	...	1	...	...	...	...	...	92	58	150		
October	...	1	1	2	1	3	...	...	...	...	...	1	...	...	...	...	94	60	154		
November	...	...	...	...	2	2	...	...	...	...	...	1	...	...	...	...	94	61	155		
December	...	1	...	1	2	3	...	...	...	...	...	...	...	...	...	...	95	64	159		
Total	...	6	16	22	14	22	5	2	...	...	7	2	2	...	...	4	...	...	...		

Analysis of Admissions and Discharges During 1960

Inmates as at 31st December, 1959	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	126
Admissions for Period ended 31st December, 1960	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	44
Discharged for period ended 31st December, 1960	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7
Deaths for period ended 31st December, 1960	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
Absconded for period ended 31st December, 1960	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total remaining at Leprosarium, 31st December, 1960	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	159

VENEREAL DISEASE IN WESTERN AUSTRALIA

Disease	Male		Female		Total	
	1959	1960	1959	1960	1959	1960
Syphilis—						
Primary   ....   ....	3	1	....	....	3	1
Secondary   ....   ....	....	2	2	1	2	3
Tertiary   ....   ....	2	1	1	1	3	2
Congenital   ....   ....	....	....	....	....	....	....
Total, Syphilis....	5	4	3	2	8	6
Gonorrhoea   ....   ....	66	69	6	18	72	87
Granuloma   ....   ....	....	....	....	....	....	....
Chancroid   ....   ....	1	....	....	....	1	....
GRAND TOTAL	72	73	9	20	81	93



## Appendix IX

# REPORT FROM THE LIBRARIAN, PUBLIC HEALTH AND MEDICAL DEPARTMENTS' LIBRARY

*To the Commissioner of Public Health*

I have the honour to submit a report on the activities of the Library for the year 1960.

There appears to have been some slight misunderstanding and confusion during the year about the policies and principles under which the Library functions. Accordingly, it is felt that an outline statement of these policies, as developed over the years, under your guidance, could be useful.

### GENERAL PURCHASING

In general, the Library bears the cost of all material, both texts and journals, for all sub-libraries. With the exception of—

- (1) those units under the Director of Tuberculosis Control (*i.e.*, Chest Clinic and the various Chest Hospital libraries), the cost of whose material is recouped from the Commonwealth ;
- (2) the Health Education Council, which itself bears the cost of all its publications, and
- (3) occasional texts for country hospitals and the Infant Health Library (where costs are charged to the units concerned)

all publications are paid for by, and so remain technically the property of, the central Library.

### STORAGE OF TEXTS

For the two reasons of limitation of space at the central Library and the desirability of local access, almost four-fifths of the Library's textual material is stored in appropriate sub-libraries. For ease of identification of storage place, all such texts are stamped with the identification stamp of the storage unit—*e.g.*, Public Health Laboratories, Government School of Nursing, State X-Ray Laboratory, etc., etc. Nevertheless, as pointed out above, such texts remain technically the property of the central Library and do not "belong" to the sub-library concerned. This ensures that the central Library can call on any material from any sub-library at short notice. In an area like Western Australia where technical libraries are few in number and the finances of these few are limited, it is essential for those libraries to have full inter-library co-operation to make the fullest use of the limited resources available. This co-operation is, in fact, of an extremely high order and all Perth's technical and special libraries inter-lend and inter-borrow very extensively. For this highly desirable state of affairs to exist, however, each library (and in this context for the Public Health and Medical Departments' Library, this means the central Library) must be able to call on all of its material easily and quickly.

### STORAGE OF PERIODICALS

In general, the principle operating here is that periodicals are bound by, and stored at, the central Library. The reasons for this are those just explained as applying to availability of texts for loan purposes. There are, however, many exceptions to this general principle. The library of the Health Education Council binds and stores its own periodicals. Those of the libraries under the Director of Tuberculosis Control are bound by the central Library but stored at the various appropriate sub-libraries. Those of several sub-libraries operating under the Medical Department, such as the State X-Ray Laboratory, Kalgoorlie Hospital and the Government School of Nursing, are also bound by the central Library and stored locally. There are also a few other minor exceptions to the general rule, *e.g.*, the School Dental Service journals, the Photographic Unit journals, the Child Guidance Clinic journals, and the country Nursing Training Schools' journals.

### CIRCULATION OF JOURNALS

All journals are circulated freely. This has obvious disadvantages such as limited availability of very recent issues, but no other policy is possible in view of the wide geographical dispersal of the various units of the Departments. The vast majority of journals have routine circulation lists, which means that all individuals who so desire, regularly have the opportunity to scrutinise all issues of selected journals. For example, almost all School Dental Officers see all six of the dental journals taken, and the nine hospital journals follow a definite pattern of circulation among the senior staff of the Medical Department. All this general-type circulation is handled by the central Library. In contrast, local circulation is handled in a few units by staff members of the unit concerned. This is the case for the State X-Ray Laboratory, the Chest Clinic, the Chest Hospital Medical Library, the Child Guidance Clinic, the Infant Health Library, the Public Health Laboratories (but not satellites) and the Virology Laboratory.

Besides this routine circulation, there is as well a special selection circulation. The contents lists of all journals are scrutinised in the central Library and articles likely to be of value or interest to any officer which appear in a journal not normally seen by him are drawn to his attention.

## SELECTION OF MATERIAL FOR PURCHASE

In general, selection for the central Library is done by the Library, but some material is purchased on request or recommendation. For sub-libraries, most of the purchases are made by direct recommendation or request from the users, after approval by the officer controlling the unit. Fairly often, however, to increase the total coverage of any subject or area, selections and purchases are made by the central Library and the material when received is placed in the relevant sub-library. This principle of selection by the central Library to help towards an overall balanced coverage in a sub-library can be very important from the point of view of the library service as a whole. Duplication of textual material is avoided as much as possible (except for standard working texts, for example, for the North-West Medical Service, the Satellite Laboratories, or the country Nursing Training Schools) but because of geographical scatter or for other reasons is sometimes inevitable.

## LENDING POLICY

The central Library is responsible for all external loans from sub-libraries except in the two specialised cases of the Child Guidance Clinic and the State X-Ray Laboratory. Loans are made freely to all local technical or special libraries and to all "authorised persons." In general this term means that material is freely available to members of the medical and associated professions but direct loans are **not** made to members of the public, trainee inspectors or trainee nurses, or lay junior members of departmental staff.

## NOTIFICATION OF RECEIPT OF PUBLICATIONS

Monthly accession lists are issued which list all material received for the central Library or any of the sub-libraries. These accession lists are widely distributed to libraries and individuals, over 100 copies being sent out each month.

## PHOTO-COPYING SERVICE

This is nominally under the control of the central Library but the actual copying is done by members of the clerical staff of the Public Health Department. All requests for photo-copies are checked and passed by the central Library before the copying is undertaken. In general, this service is restricted to senior members of both departments, and affiliated organizations. No charges are made, except to members of the Tuberculosis section where the cost is recouped from the Commonwealth.

## SUB-LIBRARIES

The sub-libraries for which the Public Health and Medical Departments' Library bears total or partial responsibility are as follows (as at 31st December, 1960) :—

- Abattoirs (Midland Junction, Robbs Jetty, Watsons Factory).
- Chest Clinic.
- Chest Hospital (Medical, Nurses' and 3 other).
- Child Guidance Clinic.
- Derby Leprosarium.
- Derby Native Hospital.
- Government School of Nursing.
- Health Education Council.
- Health Inspectors' Library.
- Infant Health Service.
- Kalgoorlie Hospital.
- North-West Medical Service (Broome, Carnarvon, Derby, Meekatharra, Port Hedland, Roebourne, Wyndham).
- Nursing Aide Training Schools (Albany, Busselton, Katanning, Merredin, Mt. Henry).
- Nursing Training Schools (Collie, Geraldton, Kalgoorlie, Narrogin, Northam).
- Photography Unit.
- Public Health Laboratories (Satellites at—Albany, Bunbury, Derby, Geraldton, Northam).
- School Dental Service.
- School Medical Service.
- State X-Ray Laboratory.
- Trachoma Unit.
- Virology Laboratory.
- Wooroloo Hospital.

There are also a few very small units at some country hospitals.



WORK DURING 1960

The work of the Library during the year can be partly summarised by comparative tabulations as follows :—

Items	1958	1959	1960
Publications received ....	612	658	575
Additional journals received ....	N/A	21	34
Total journals received ....	314	335	369
Average monthly routing ....	N/A	300	528
Borrowing :			
From all other libraries ....	125	275	392
From W.A. libraries ....	103	242	343
From Medical library ....	43	168	248
From libraries outside W.A. ....	22	33	49
Lending :			
To all other libraries ....	264	247	273
To Medical library ....	163	89	89
Organisations to whom loans made ....	20	21	27

As can be seen there was a tremendous increase in the routine circulation of journals. This was mainly due to increased demand by the staff of the Public Health Laboratory Service—the main laboratories, the satellites and the Virology Laboratory. Total borrowing from other libraries also increased greatly by 117 items, 80 of these coming from the Medical Library. The total of 89 loans to the Medical Library does not include regular lending of journals. It is apparent that this Library is coming to rely more upon the Medical Library and it is pleasant to emphasise again the very close co-operation of the two units.

During the year provision was made for an extra staff member. It is apparent the increase in regular monthly routing alone made this unavoidable.

Accommodation problems are still acute but there are good prospects that during 1961 this urgent problem will be tackled and largely overcome. If this is indeed done, the Library hopes to at least maintain and, if possible, improve the standard of its services to every unit of the Departments.

JOHN F. WOOLCOTT, M.B., Ch.B.,  
Librarian.

## Appendix X

### ABSTRACTS OF CONTRIBUTIONS TO THE LITERATURE BY AUTHORS ASSOCIATED WITH THE DEPARTMENT 1958-60

Crothy, J. M. ; Mann, Ida and McLean, D. M. *Trachoma in Northern Australia. Bacteriologic and Virologic Aspects.* American Journal of Ophthalmology 1959, **47**, 503-508.

Authors' Summary : During June, 1957, bacteriologic and virologic investigations were undertaken on Australian aborigines affected with trachoma who lived at Groote Eylandt, Oenpelli and Goulburn Island in the Northern Territory. The disease was almost entirely in the form of "trachome pur" with practically no cicatrization or pannus and a very low blindness rate.

Hemolytic staphylococci were found in the eyes of three patients out of 66 examined but they were not present in the noses. B hemolytic streptococci were found only in the noses of three patients but not in their eyes. Friedlander's bacillus was found in the eyes and nose of one patient and in another patient it was present only in the eye. This low incidence of bacterial pathogens is remarkable.

Attempts to isolate a virus from 38 patients using established cultures of human amnion and Hela cells and from explants of conjunctiva from patients were unsuccessful.

No virus like inclusions were seen in stained smears of tonsal conjunctiva from 51 patients.

Kovacs, N. *Salmonellae in Desiccated Coconut, Egg Pulp, Fertilizer, Meat-meal and Mesenteric Glands. Preliminary Report.* Medical Journal of Australia, 1960, **i**, 557-559.

This paper records the results of investigations into the occurrence of salmonellae in some vehicles which could be agents in the increasing incidence of salmonella infection in man. Some of the serotypes discovered were previously unknown in Western Australia.

Kovacs, N. *A Micro-method for Detecting Indol Formation.* Journal of Clinical Pathology, 1959, **12**, 90.

This short paper does not lend itself to abstracting. The method described had proved a useful and simple test.

Kovacs, N. *The Control of Tuberculosis in Australia.* Medical Journal of Australia, 1960, **ii**, 435. (Correspondence.)

The first report of the finding of Group III "Anonymous Mycobacteria" in animals (pigs) in close contact with man.

Mann, Ida. *Researches into the Regional Distribution of Eye Disease.* American Journal of Ophthalmology, 1959, **47**, 134-144.

Author's Summary : 1. An account is given of the occurrence of diseases of the anterior segment of the eye in four areas of Australasia—the territories of Papua and New Guinea, the Kimberleys, the South-west of Western Australia and the Eastern Goldfields.

2. The following diseases are specially considered : glaucoma, cataract, strabismus, pterygium, trachoma, uveitis, sympathetic ophthalmitis, leprosy, nontrachomatous folliculosis, nutritional disease and congenital abnormalities.

3. Possible meanings and lines for future investigation are indicated.

Mann, Ida. *Investigation of the Sources of Trachoma in the White School Population of Western Australia.* British Journal of Ophthalmology, 1960, **44**, 321-323.

Author's Summary : Twelve schools taking only white children and 12 schools taking both white and aboriginal children were examined to find the sources of infection with trachoma in the white children.

In the "all-white" schools there were 141 cases, 96 of them in white children of foreign origin.

In the mixed schools there were 105 cases in white children of whom only 19 were foreign immigrants.

Therefore there are two probable sources of infection : one from native children, the other from migrants, mainly Italians, with some Poles and Yugoslavs.

In a few places, however, trachoma is still endemic in a white population with neither native nor immigrant contacts.

There is a definite danger that increased immigration is introducing trachoma into areas without native contacts which were previously free of it.

Mann, Ida. *Experimental Treatment of Australian Trachoma with special reference to Lederkyn.* British Journal of Ophthalmology, 1960, **44**, 324-336.

Author's Summary : It is not possible to assess results (of a mass campaign for eradication of trachoma) in percentages of cures since some cases were not followed-up long enough and others ran the risk of re-infection. We can say, however, that in every case observed the same sequence of events took place within the first three months : flattening of the follicles, disappearance of hyperaemia and of papillary hypertrophy and cessation of discharge if this had been present.



That Lederkyn acts by killing the virus is shown by the number of patients observed who had no secondary infection. The general impression is that the response to Lederkyn is quicker and better than that to the other sulpha drugs we have tried, and even apart from this, the ease of its administration makes it at the moment the treatment of choice.

It is proposed therefore to use Lederkyn in the annual treatment in schools and stations in Western Australia for the present.

Mann, Ida ; Greer, C. H. ; Perret, Dorothy and McLean, C. *Experimental Trachoma produced by a West Australian Virus*. British Journal of Ophthalmology, 1960, **44**, 641-8.

Authors' Summary : The clinical and laboratory features of experimental trachoma in a human volunteer are described. The virus was obtained in Western Australia from an asymptomatic half-caste boy with necrotic follicles in his upper tarsal conjunctiva and was passaged in embryonate eggs. An infected volunteer developed muco-purulent conjunctivitis, epithelial keratitis, pre-auricular adenitis, small granular follicles, pannus and typical cytoplasmic inclusions. The virus was recovered from conjunctival scrapings and again cultured and passed in eggs.

Perret, Dorothy and Mann, Ida. *Isolation of Virus from Embryonate Eggs Inoculated with material from a Case of Trachoma in Western Australia*. British Journal of Ophthalmology, 1960, **44**, 503-505.

Authors' Summary : An agent of the psittacosis-lymphogranuloma venereum group of viruses has been isolated from embryonate eggs inoculated with conjunctival scrapings taken from a clinical case of trachoma in an Australian aboriginal child. The laboratory tests suggest that the agent has the characteristics of the trachoma virus isolated by Tang and others (1957) and by Collier and Sawa (1958) but confirmation of its identity must await positive results from inoculation of the agent on to the conjunctiva of Rhesus monkeys and, if possible, of human volunteers.

Plummer, R. *Photomicrography by Electronic Flash*. Medical and Biological Illustration, 1958, **8**, 23-29.

Author's Summary : A method and apparatus for taking photomicrographs using commercial electronic flash equipment is described. High intensity illumination allowing rapid exposure with a colour temperature suitable for daylight type colour films are some of the advantages of flash photomicrography.

Ease of operation, including the recording of living organisms and stained and unstained slides at magnifications up to X256 on the 35 mm. transparency, are possible when using a X8 ocular. The apparatus is not intended to take the place of precision equipment but the author offers it as a simple method of obtaining routine photomicrographs.

Plummer, R. and Stuart, C. *The Reproduction of Roentgenograms by Electronic Flash*. American Journal of Roentgenology. Radium Therapy and Nuclear Medicine, 1959, **82**, 311-318.

Authors' Summary : A new method for reproducing Roentgenology by flash transillumination is described. The illuminant, which is an electronic flash tube, allows a considerable latitude of aperture settings for each Roentgenology. Colour reversal film is used when making transparencies for projection and when copying a Roentgenology of average density, 100 joules at f11 was found to give excellent results. The value of this method in a busy radiologic diagnostic department is emphasized.

Snow, D. J. R. *Some Aspects of Epidemiology and Preventive Medicine Abroad*. Medical Journal of Australia, 1960, **i**, 630-633.

A record of certain observations and personal impressions arising out of a visit to Europe and North America from March to September, 1959. The object of this visit was to examine methods being used in the prevention of disease with special reference to the epidemiological approach with emphasis more on principles than on details. Epidemiologic principles are discussed in the light of specific examples.

Snow, D. J. R. and Lewis, B. H. *Salk Vaccination : Reactions and Sequelae. Observations in Western Australia*. Medical Journal of Australia, 1960, **ii**, 891-2.

Describes undesirable reactions experienced in administering 1,300,000 separate doses of Salk Vaccine to about 480,000 people. The authors conclude : " It can be stated that although Salk vaccine has not proved to be absolutely free from undesirable reactions, these have been so few and far between that the vaccine may be generally regarded as one of the most acceptable agents ever used in the prevention of disease."

# Appendix XI

## SCHOOL MEDICAL REPORT

Many country schools are now up to date on a two-year inspection schedule and all have been examined within three years.

A total number of 60,207 children were examined, of whom 23,412 were in the country. The parents of 20,342 were notified of some defect or other, including dental defects, 5,267 were referred for medical attention, Table II shows a good response by the parents in obtaining this medical attention.

A total of 72,376 children were examined for pediculosis (Table III) and the number notified as infected was 180. Re-visits to ensure that effective treatment had been carried out brought the total number of heads inspected up to 93,843.

There is a noticeable decrease in the number of ear, nose and throat conditions and it is thought that this may be due to the use of antibodies in throat infections, thus preventing the development of chronic infections which are so hard to cure.

Table I

### SCHOOL MEDICAL SERVICE

EXAMINATION OF METROPOLITAN AND COUNTRY SCHOOL CHILDREN, 1960

—	Number Ex- amined	Number Notified	Number Referred for Medical Atten- tion	Number Referred for Home Atten- tion and Obser- vation	Number Requir- ing Dental Atten- tion	Skin Complaints		Nutrition			Eyes Medical Atten- tion	Tonsils Medical Atten- tion	
						Num- ber	Per cent.	3	Under 3	Over 3			
Metropolitan Schools													
Boys	....	19,461	6,004	1,445	2,126	3,102	903	4·64	17,825	408	1,228	751	79
Girls	....	17,334	5,590	1,444	1,798	2,954	1,120	6·40	15,393	445	1,496	761	83
Total	....	36,795	11,594	2,889	3,924	6,056	2,023	5·40	33,218	853	2,724	1,512	162
Country Schools													
Boys	....	11,949	4,502	969	1,523	2,732	1,108	9·10	11,171	144	634	982	63
Girls	....	11,463	4,246	1,309	1,305	2,612	936	8·01	10,315	181	967	753	45
Total	....	23,412	8,748	2,378	2,828	5,344	2,044	8·76	21,486	325	1,601	1,735	108
State Total													
Boys	....	31,410	10,506	2,414	3,649	5,834	2,011	6·40	28,996	552	1,862	1,733	142
Girls	....	28,797	9,836	2,753	3,103	5,566	2,056	7·16	25,708	626	2,463	1,514	128
Total	....	60,207	20,342	5,267	6,752	11,400	4,067	6·75	54,704	1,178	4,325	3,247	270

Table II

HOME VISITS BY SCHOOL NURSES, 1960

Total Visits <i>re</i> Medical Attention	Received Attention	Promised Attention	Disinterested	Out or Left District	Visit to Cases Referred for Home Attention	Parents Phoned or Called at Office
4,009	1,667	851	166	765	77	98

Country Areas :        visits made.

Table III

HYGIENE INSPECTION BY NURSES FOR PERDICULOSIS

—					No. of Children Examined	Number Notified	Percentage	
Metropolitan	.....	.....	.....	.....	47,711	46	·09	
Country	.....	.....	.....	.....	24,665	134	·54	
Total	.....	.....	.....	.....	72,376	180	·24	

Including Revisits to above, a total number of 93,843 Heads were examined or re-examined.



## Appendix XII

### REPORT BY SENIOR DENTAL OFFICER

*Commissioner of Public Health*

Following is my report for the year ending 30th December, 1960.

The staff position deteriorated so much because of age retirements, resignations and a death that from a total of 15 at the beginning of January, it had fallen to nine by the end of December ; accordingly not a great deal of ground was covered although emphasis continued to be placed on the outlying country districts.

An innovation during the year was the establishment of a dental suite in the District Hospital at Derby and a dentist and dental technician were sent up to man it. They not only attended children as usual but treated the following classes of adults also free of charge :—

Pensioners.

Mission Staff.

Sisters of the Church.

Natives.

In addition, the dentist provided a service for paying white adult patients and the fees for this work were paid into the Public Health Department. During the course of the year the Derby dental team made visits to the following places :—

Wyndham, Broome, Halls Creek, Fitzroy Crossing, Cockatoo Island, Kalumburu, Forrest River, Lombadina, Beagle Bay, La Grange, Mowanjum.

#### *Figures for Schools Dental Services—*

Number of country schools visited	....	....	....	....	....	....	....	103
Number of metropolitan schools visited	....	....	....	....	....	....	....	17
Number of Native Missions visited	....	....	....	....	....	....	....	8
Number of Orphanages visited	....	....	....	....	....	....	....	12
Number of children examined	....	....	....	....	....	....	....	10,470
Number of children treated	....	....	....	....	....	....	....	6,213
Number of children needing no treatment	....	....	....	....	....	....	....	3,441
Number of children who were to receive treatment by private dentists	....	....	....	....	....	....	....	248
Number of children whose parents did not bother to reply to notices sent out	....	....	....	....	....	....	....	568

#### *Details of treatment given—*

Silver amalgum fillings	....	....	....	....	....	....	....	5,526
Copper amalgum fillings	....	....	....	....	....	....	....	1,753
Cement fillings	....	....	....	....	....	....	....	1,021
Porcelain fillings	....	....	....	....	....	....	....	626
Silver Nitrate treatments	....	....	....	....	....	....	....	747
Gold inlays	....	....	....	....	....	....	....	3
Other conservative treatments	....	....	....	....	....	....	....	4,922
Prophylaxis	....	....	....	....	....	....	....	1,021
Extractions	....	....	....	....	....	....	....	8,227
Dentures	....	....	....	....	....	....	....	17
Orthodontic treatment	....	....	....	....	....	....	....	7
Pulp (nerve) treatment	....	....	....	....	....	....	....	22
Talks to P. and C. Association, Films shown, etc.	....	....	....	....	....	....	....	209

#### *Figures for the Derby Centre (apart from children) are as follows :—*

Number of white free list adults attended	....	....	....	....	....	....	....	35
Fillings for white free list adults attended	....	....	....	....	....	....	....	39
Extractions for white free list adults attended	....	....	....	....	....	....	....	38
Dentures for white free list adults attended	....	....	....	....	....	....	....	6
Number of native adults attended	....	....	....	....	....	....	....	141
Fillings for native adults attended	....	....	....	....	....	....	....	36
Extractions for native adults attended	....	....	....	....	....	....	....	185
Dentures for native adults attended	....	....	....	....	....	....	....	11
Number of paying patients	....	....	....	....	....	....	....	376
Fillings for paying patients	....	....	....	....	....	....	....	249
Extractions for paying patients	....	....	....	....	....	....	....	450
Dentures for paying patients	....	....	....	....	....	....	....	35

Fees collected from paying patients, £993 17s.

A. G. McKENNA,  
Senior Dental Officer.

February, 1961.

## Appendix XIII

### REPORT BY THE CHIEF INSPECTOR

*Commissioner of Public Health*

I have the honour to submit a report on the activities of the Inspection Branch for the year 1960.

#### ENVIRONMENTAL SANITATION

Surveys of river and ocean bathing places continued throughout the year. The number of samples taken was 904. These surveys, inaugurated two years ago, have now become part of the routine work of the branch.

Another routine task of a similar nature is the placement and collection of Moore's swabs in all principal water supply reservoirs. This work entailed 200 visits by inspectors.

Approval was given to 8,898 applications for permission to install small domestic sewage treatment tanks. Thirty-five per cent of these applications were for tanks intended for the treatment of all household liquid wastes ; the remainder were for sewage only. Some of these installations were designed for use with six pint or two pint flushing units. Three hundred and thirty-eight cisterns and 333 pedestal pans were tested and approved for use with these reduced flush systems.

Pest Control officers of the branch made 344 visits to Government institutions for the control of animal and insect pests. The number of rats, pigeons, opossums, etc., destroyed was 1,122.

General inspections and investigations may be summarised as follows :—

Town surveys	....	....	....	....	....	....	....	....	....	104
Hospitals	....	....	....	....	....	....	....	....	....	61
Public Buildings	....	....	....	....	....	....	....	....	....	44
Housing sub-divisions	....	....	....	....	....	....	....	....	....	307
Appeals (Section 37, Health Act)	....	....	....	....	....	....	....	....	....	7
Miscellaneous surveys and investigations	....	....	....	....	....	....	....	....	....	214

These figures do not give a very accurate picture of the work done as the amount of time spent on each inspection may vary from a few hours to two or three weeks, and, in some instances, the enquiry may continue at intervals over several months.

Two officers of the branch, Mr. J. Slattery and Mr. W. Moyle, have been engaged, for a large part of their time, in work associated with committees established to advise on rubbish disposal and fly control, and have submitted separate reports on these activities.

There have been many occasions during the year when the general inspection staff has been unable to cope with the problems and enquiries awaiting attention. These delays have been unavoidable.

#### FOOD AND MEAT INSPECTION

The number of animals submitted for inspection by Departmental inspectors at metropolitan abattoirs was 1,368,496, an increase of 64,660 over the previous year's figure.

Details of slaughtering for home consumption and the causes of condemnation are shown in Appendix. 1,437·7 tons of imported fish were inspected at Fremantle Wharf. 367·5 tons more than during 1959.

Six hundred and fifty-three samples of food were submitted for bacteriological examination or chemical analysis.

#### PUBLIC BUILDINGS

Plans were examined for 136 new buildings and alterations and additions to 90 existing buildings.

This Department is again indebted to the Principal Architect and his staff and the officers of the Electrical Section of the Mechanical and Plant Engineers Branch for their assistance in the supervision of public buildings.

#### PESTICIDES

One hundred and forty-five applications for registration were considered by the Pesticide Advisory Committee during the year. One hundred and forty of these were approved.

Two hundred and eighteen products previously registered have been cancelled, leaving the number of pesticides now registered with the Department at 893.

#### HEALTH INSPECTORS' CONFERENCE

The Annual Health Inspectors' Conference was held in Perth on 29th and 30th September, 1960.

The Conference was opened by the Minister for Health, Hon. Ross Hutchinson, D.F.C., and was followed by an address by the Acting Commissioner of Public Health, Dr. W. S. Davidson.



The following addresses were also given :—

Fire Protection (Mr. C. Thomson. Special Services Inspector, W.A. Fire Brigades).

An Approach to Health Education in Schools (Dr. J. F. Woolcott).

Sanitary Landfill (Mr. J. Slattery).

An Approach to Fly Control (Mr. W. Moyle).

On the 30th September the delegates were taken on a conducted tour of a large Food Processing Factory.

C. E. FLOWER,  
Chief Inspector.

## Appendix XIV

### FLY CONTROL, 1960-61

In June, 1960, a Fly Control Committee was formed to co-ordinate and stimulate fly control in the metropolitan area. This Committee comprised officers of the Agricultural Department, a representative each from the Health Inspectors' Association, Health Education Council, Local Government Association and Road Districts Association, as well as officers of the Public Health Department. Inspector Moyle was appointed as a liaison officer between the Committee, Local Authorities and Government Departments.

With advice from a sub-committee including senior local authority inspectors a course of two days' training on fly control was organised for all metropolitan inspectors. The syllabus covered the following :—

- Introduction to flies, life cycle, rate of reproduction, longevity, breeding media, flight range, etc.
- Fly-borne diseases.
- Screening.
- Sanitary measures to limit fly breeding.
- Insecticides and equipment in fly control.
- Demonstration of deep litter in poultry keeping.

All inspectors attended one of the six courses held during August and September. The matter of fly control legislation was also discussed by the above sub-committee and on 2nd March, 1961, the Fly Eradication Regulations were gazetted to operate in metropolitan local authorities.

Publicity on fly control was undertaken by the Health Educational Council, who also produced pamphlets for local authorities. A 16 mm. film on backyard fly control should be available for the 1961-62 summer.

Government properties were given particular attention following a Departmental circular requesting their co-operation. Co-operation by other Departments was found to be generally satisfactory and in many instances an officer was appointed to be responsible for fly control.

The Committee felt that the greatest benefit would result from personal contact between inspectors and householders. It was appreciated that pressure of other work would prevent most metropolitan inspectors from making the necessary contact with the public, therefore it was decided to train senior University students as fly control officers for local authorities prepared to employ them during the holiday period. At the end of November four senior medical students and one Road Board traffic inspector were given a three-day course of instruction. In order to make up a suitable class, four other officers from various Government Departments were also accepted for the course.

Local authority response to the move for the employment of students was most disappointing. This was unfortunate as the local authorities who employed them were very pleased with their services. It can also be recorded that almost without exception they were well received by the public.

During the year the common housefly was found to be by far the most numerous and also the most troublesome fly. In the spring months a high incidence of lesser houseflies was noted and these were found to be breeding in poultry manure, both in backyards and in commercial poultry farms. Stable flies were found in practically all cases where horses and cows were stabled and in purely residential areas stable flies sought out and tormented certain breeds of dogs. Although stable flies are blood feeders they do not normally attack human beings in preference to animals and therefore are not always recognised from common houseflies. In outer suburban areas two complaints of flies were investigated and the flies were identified as bush flies.

Flies generally appeared to be most numerous in late spring and again in autumn. The somewhat lower numbers during summer must be attributed in part to the very hot, dry conditions experienced which dried out quantities which would otherwise have been suitable breeding media.

In residential areas the main breeding sites were found to be the heaps of lawn clippings, backyard poultry, buried food scraps and heavy surface applications of organic manure. Observations indicate that where a large degree of personal contact has been made between inspectors and householders, fly breeding can be reduced substantially.

Apart from backyard fly breeding, the main breeding sites were found to be market gardens, poultry farms, piggeries and stables. Residents in close proximity to these premises suffered most with flies and naturally most complaints were made by them.

It is apparent that improved sanitational measures to reduce fly breeding are required at market gardens in particular. In order to achieve this, there is need for more publicity to increase fly awareness and more field work to determine the best methods of carrying out control.

While it is extremely difficult to assess results of the fly campaign over the whole of the metropolitan area, observations and enquiries have been made and these may be summarised as follows :—

- (1) The public awareness of flies has increased as may be instanced by the increasing number of complaints, which, on investigation, revealed relatively low numbers of flies.
- (2) The public knowledge of flies and fly breeding has improved over the last few years. The marked improvement in the standard and maintenance of rubbish bins may be due to this extra knowledge.



- (3) In residential areas flies were generally at a lower level than during the preceding summers.
- (4) Apart from the public response, local authorities have reduced fly breeding by the elimination of a number of sanitary sites and by improved rubbish removal and disposal services.
- (5) The use of University students as auxiliary inspectors was a success.
- (6) Local authorities which put most effort into the fly campaign reaped the greatest benefit.
- (7) While progress in regard to fly control in residential areas can be shown it is apparent that further investigation into control at market gardens is necessary.

W. H. MOYLE,  
Inspector.

## Appendix XV

### METROPOLITAN RUBBISH DISPOSAL PLANNING COMMITTEE SUMMARY OF REPORT BY INSPECTOR J. F. SLATTERY

#### HISTORY

With the rapid growth of the metropolitan area during the post-war years, it became apparent that new methods and new sites for the disposal of rubbish were urgently needed.

The accepted method of disposal by burning and covering had never been entirely satisfactory and with the rapid utilisation of land for housing, some Local Authorities were unable to provide suitable sites for this form of disposal, and in some instances land in an adjoining Authority had to be sought.

During the period 1957/58 an enquiry was conducted into all aspects of rubbish collection and disposal and information was collated in respect to sites, the nature and quantity of refuse produced, vehicles used and man-power employed, and all other relevant practical and economic factors.

This enquiry indicated that 32 disposal sites were in use by 27 Local Authorities for the disposal of 400,000 cubic yards of domestic rubbish and 40,000 cubic yards of industrial refuse. The disposal methods, charges and operational techniques varied with each Local Authority. In several instances, separate disposal sites were situated only a few chains apart, separated only by a Local Authority boundary. Only six of the sites could be classified as reasonably satisfactory.

#### FORMATION OF CENTRAL COMMITTEE

When this information was presented to a meeting of Local Authority representatives in June 1958, the need for improvement in rubbish services was recognised and it was decided to establish the "Metropolitan Rubbish Disposal Planning Committee", comprising six Local Authority representatives, later increased to seven, and officers of the Town Planning, Metropolitan Water Supply and Public Health Departments.

The specific aims of this Committee were :—

- (1) To examine and evaluate existing collection and disposal methods and costs.
- (2) To suggest policy to be adopted with regard to collection and disposal methods, and the location of disposal areas.
- (3) To consider whether any existing sites should be closed.
- (4) To examine the particular problems faced by some Local Authorities and suggest remedies.
- (5) To study areas available for use as future disposal sites and make appropriate recommendations.
- (6) To assess annual acreage requirements for disposal of refuse.
- (7) To suggest circumstances and schemes whereby co-operation between Local Authorities could promote improved services and economic efficiency.

After several meetings and the examination of all existing and proposed sites, the Committee recommended that, in their opinion, improvement could best be attained by :—

- (1) The adoption of sanitary landfill as the only acceptable method of disposal.
- (2) The division of the Metropolitan Area into six zones, with one disposal site located in each zone.

To implement these proposals, the Committee adopted a plan which included :—

- (1) The gradual reduction of rubbish sites in the Metropolitan Area to six, with three north of the river and three south of the river.
- (2) The establishment of co-operative ventures between Local Authorities to combine in using one site within a proposed zone.
- (3) To provide for the control of each site by a zone committee ; each zone committee to have representation on the Metropolitan Rubbish Disposal Planning Committee.

The plan, in the first instance, was to be applied to the 23 Local Authorities comprising the inner Metropolitan Area.

#### FORMATION OF ZONES

The first meeting of a Zone Committee was held in March, 1959, and by February, 1960, all proposed zones, with their respective committees, had been established.

By December, 1960, of the 23 Local Authorities affected by the first phase of the plan, 18 had agreed to enter into a zone and a further three had accepted the scheme in principle and awaited inclusion in a zone, when practicable. Eleven disposal sites had been discontinued and of the remaining sites, six were being used on a voluntary co-operative basis by 18 Local Authorities.

In all but one instance, accepted sanitary landfill principles had been adopted and were in use. Rubbish disposal was being used for river foreshore reclamation, lake improvement, the reclamation of swamp land and disused sand-pits ; and, in one instance, for the construction of spectator mounds at a sports oval.

The establishment of zone committees has permitted close liaison between the participating Local Authorities and between the Zone and Central Metropolitan Planning Committees, and this co-operation has produced an efficient and economic rubbish disposal service, operating in accordance with careful planning to convert useless land to playing fields and reserves.



## FUTURE PLANNING

The co-operation of Local Authorities and their general acceptance of the first stage of the rubbish disposal scheme has encouraged the Central Planning Committee to propose the following activities for 1961 :—

- (1) Extension of zones to include non-participating Local Authorities.
- (2) Reconstitution of zones where necessary.
- (3) Extension of planning to outer Metropolitan Area.
- (4) Improvement of existing sites and planning of future sites.
- (5) Extension of services and provision of a minimum of a weekly service.
- (6) Improvement of cartage vehicles.
- (7) Elimination of pan services and investigation of an alternative to the existing builders' pan service.
- (8) Investigation of the use of disposable refuse containers.

Some preliminary work has already been done on two of these projects.

Twelve rubbish disposal units of specially treated paper for use indoors have been obtained and are in use experimentally, and it is anticipated that six units, capable of replacing the usual metal rubbish bin, will be available shortly. These units will be distributed to Zone Committees for evaluation.

## NIGHTSOIL DISPOSAL

The ultimate elimination of the pan system and the closure of existing nightsoil disposal sites is a desirable objective. Present figures indicate that there are 7,000 pan services in the Metropolitan Area and that 60 per cent. of these are for houses under construction.

Up to now, the need to provide temporary pan services for use of workmen employed on building construction has been the biggest obstacle to the abolition of this system. However, recently two special " bore hole " type units have been constructed and if these prove successful in experimental use, it should be possible to provide either septic tanks or connections to a sewer for the remaining 40 per cent. of these services and make the abolition of the outmoded and malodorous pan system a practical possibility.

Appendix XVI

NURSING SECTION – ANNUAL REPORT FOR 1960

Commissioner of Public Health

Hospital Staffing

The hospital staffing position has continued to remain at the satisfactory level reached last year and it is safe to say that a better standard of nursing service has resulted from the greater availability of experienced trained nurses and enrolled nursing aides.

North-West Hospitals are no longer unpopular with trained staff and nursing aides are most anxious to obtain positions in that area of the State.

At the time of presenting my report for the year 1959, the Nurses' (Public Hospitals) Award (No. 19 of 1958) had been implemented only three months before, and it was not possible to assess the effect on employment of the Country Service Allowance and the Medical Department's Bonus of £25 for each satisfactory six months' service. Results have now proved the value of these emoluments and trained nurses are remaining in positions for longer periods than before.

During the year there have been no changes in senior nursing appointments.

NURSING BURSARIES (AS AT 31st DECEMBER, 1960)

Bursaries Granted for Years	Number Granted	Bursary Completed	Withdrawals		Staff Nurses graduated during 1959 and 1960	Expected Number of graduate nurses to be available for year—					
			Number	Percentage		1961	1962	1963	1964	1965	Total
1955 and 1955-56	45	5	20	44.4	18	2	....	....	....	....	2
1956 and 1956-57	40	....	13	32.5	1	26	....	....	....	....	26
1957 and 1957-58	67	....	22	32.8	....	1	42	2	....	....	45
1958 and 1958-59	52	....	13	25.0	....	....	2	36	1	....	39
1959 and 1959-60	61	....	7	11.5	....	....	2	3	49	....	54
1960 and 1960-61	73	....	2	3.1	....	....	....	....	5	66	71
Total ....	338	5	77	22.8	19	29	46	41	55	66	237

The Nursing Bursaries are now having an effect on staffing in country hospitals. During the year 18 appointments have been made and it is likely that during 1961 bursars will be appointed to country hospitals other than Training Schools.

SCHOLARSHIPS AWARDED FOR POST GRADUATE STUDY

The following persons were awarded scholarships for study in Diploma Courses at the College of Nursing, Australia, this academic year :—

Miss M. E. Beard	....	....	....	Nursing Administration
Miss M. Underwood	....	....	....	Sister Tutor
Mr. R. O. Dee	....	....	....	Sister Tutor

The scholarship covered salary, College fees and return fares between Perth and Melbourne.

All of the above were successful in gaining their diplomas with distinctions in some subjects. Miss Beard returned to her position as Assistant Matron (Inspections), Miss Underwood returned to Geraldton District Hospital as Tutor and Mr. Dee resumed as Tutor, Mental Health Service.

Miss M. C. Morrissey, Diploma Nursing Administration, relieved Miss Beard during her absence at the College of Nursing, Australia.

SPECIAL UNITED KINGDOM NURSING RECRUITMENT SCHEME

No recruitment conducted under this scheme during 1960.

MATRONS' CONFERENCE

The Matrons' Conference was held from 10th to 14th October, 1960, at the Nurses' Memorial Centre, 34 Kings Park Road, West Perth. Thirty-seven Matrons of country hospitals were present. The Conference was organised by the Medical Department and the Royal Australian Nursing Federation (W.A. Branch).

The Annual Conference is of inestimable value, particularly to the country Matrons. Their presence is made possible by the co-operation of the Medical Department in granting allowances covering salary, living expenses and fares.

HOSPITAL INSPECTIONS

Many country hospitals were visited in 1960. These included the North-West and Eastern Goldfields.



PRIVATE HOSPITALS AND MATERNITY HOMES

Routine inspections of Private Hospitals and Maternity Homes were carried out during the year, 1960.  
Number of inspections—

“ A ” Class	....	....	....	....	....	30
“ C ” Class	....	....	....	....	....	114
Maternity Homes	....	....	....	....	....	37

NEW REGISTRATION OF “ C ” CLASS HOSPITALS

				Total No. of Beds
Althea, 39 Outram Street, West Perth	....	....	....	11
Skye, 13 Stephen Street, Fremantle	....	....	....	8
Fairhill, 14 Stirling Street, Fremantle	....	....	....	16
Nadezda, Oswald Street, Innaloo	....	....	....	25
Corlei, Ley Street, Manning	....	....	....	20
Carmel, Camboon Street, Morley Park	....	....	....	20
St. Florence, Guildford Road, Mt. Lawley	....	....	....	16
				116

There are now 54 registered “ C ” Class Hospitals. Total number of beds 896.

NURSE TRAINING

*Government School of Nursing—Staff*

- Miss E. E. Harler, Diploma Nurs. Admin., Organiser of Nurse Training.
- Miss V. Hobbs, Sr. Tutor Diploma, Principal Tutor.
- Mrs. D. Campin, Sr. Tutor Diploma.
- Miss P. Smart, Tutor without Diploma.
- Miss M. Hewett, Sr. Tutor Diploma, District Hospital, Kalgoorlie.
- Miss M. Underwood, Sr. Tutor Diploma, District Hospital, Geraldton.
- Miss F. N. Lovelock, Tutor without Diploma, District Hospital, Northam.

*Repatriation General Hospital*

The Preliminary Training School students attend the Repatriation General Hospital each week for two hours to observe nursing practice.

Theatre experience is made available to Geraldton and Northam trainee nurses. The Theatre Sister also conducts demonstration and instrument lectures to Third Year Nurses.

No Repatriation General Hospital trainees are attending the Government School at present.

*Pilot Course—Maternity Nursing Experience in the Basic Curriculum*

Two trainee nurses from Government Training School.

*Nursing Recruitment for 1960*

Metropolitan High Schools were visited. Publicity was given in an endeavour to improve the knowledge of the educational requirement for General Nurse Training. The advantage of a higher standard of education to girls desiring to nurse, still requires publicity.

*Visits to General and Nursing Aide Training Hospitals*

Kalgoorlie	....	....	....	....	....	....	2
Northam	....	....	....	....	....	....	2
Geraldton	....	....	....	....	....	....	1
Merredin	....	....	....	....	....	....	2
Busselton	....	....	....	....	....	....	2
Katanning	....	....	....	....	....	....	2
Collie	....	....	....	....	....	....	2
Albany	....	....	....	....	....	....	2
Mount Henry	....	....	....	....	....	....	2
Narrogin	....	....	....	....	....	....	2

*General Nurses in Training—1960*

General Training	....	....	....	....	....	165
Commenced Training	....	....	....	....	....	52
Completed Training	....	....	....	....	....	48
Passed Finals	....	....	....	....	....	48
Passed Finals with Credit	....	....	....	....	....	5
Failed Finals	....	....	....	....	....	1
Terminations	....	....	....	....	....	7
Resignations	....	....	....	....	....	13 (includes—
Transfer to Nursing Aides)	....	....	....	....	....	4

*Nursing Aides in Training—1960*

Nursing Aides in Training	....	....	....	....	172
Completed Training	....	....	....	....	93
Terminated	....	....	....	....	20
Resignations	....	....	....	....	10

PHYLLIS F. LEE,  
Principal Matron.



Appendix XVII

NURSES' REGISTRATION BOARD

The Commissioner of Public Health

I submit the Annual Report for the Nurses' Registration Board for the year ended 31st December, 1960. During the year 11 Board Meetings were held in the Department of Public Health.

EXAMINATIONS

Examinations for Registration were conducted and included :—

	Examination						Candidates
General Nursing	....	....	....	....	....	3	308
Psychiatric	....	....	....	....	....	3	14
Dental ....	....	....	....	....	....	1	9
Tuberculosis	....	....	....	....	....	3	30
Mothercraft	....	....	....	....	....	3	10
Midwifery	....	....	....	....	....	3	00
Infant Health	....	....	....	....	....	3	12

NURSING AIDE FOR ENROLMENT

Examination	Candidates
3	138

FIRST YEAR GENERAL NURSING

Examination	Candidates
3	534

FIRST YEAR PSYCHIATRIC

Examination	Candidates
3	24

APPLICATIONS FOR REGISTRATION FROM NURSES TRAINED OUTSIDE THE STATE

General	....	....	....	....	....	....	232
Childrens'	....	....	....	....	....	....	1
Psychiatric	....	....	....	....	....	....	9
Dental ....	....	....	....	....	....	....	....
Tuberculosis	....	....	....	....	....	....	....
Mothercraft	....	....	....	....	....	....	....
Midwifery	....	....	....	....	....	....	162
Infant Health....	....	....	....	....	....	....	6
Nursing Aide Enrolment	....	....	....	....	....	....	6

The number of nurses in the various divisions of the register and nursing aides on the roll, where registrations or enrolments were in force at 31/12/60 was :—

General	....	....	....	....	....	....	3,847
Children's	....	....	....	....	....	....	10
Midwifery	....	....	....	....	....	....	1,643
Infant Health....	....	....	....	....	....	....	305
Mental ....	....	....	....	....	....	....	314
Tuberculosis	....	....	....	....	....	....	124
Mothercraft	....	....	....	....	....	....	55
Dental ....	....	....	....	....	....	....	24
Nursing Aides	....	....	....	....	....	....	583

In May, Miss D. H. Bailey was appointed as Education Officer, this being the first appointment of its kind to this Board.

G. I. SMITH,  
Secretary.

Appendix XVIII

OCCUPATIONAL HEALTH

As last year, the scope of work undertaken falls into three categories :—

- (1) Systematic surveys of industrial hazards.
- (2) Investigations of current problems.
- (3) Education.

1.—SYSTEMATIC SURVEYS OF INDUSTRIAL HAZARDS

(a) *Continued from 1959*

*Silicosis.*—The survey was almost completed and the figures at 31st December, 1960, are :—  
(1960 figures in brackets)

Place of Work	Number Visited	Number in which employees had X-rays	Number of employees 17 in. x 14 in. Chest Films	Evidence of Silicosis	Percentage
Foundries ....	*41 (26)	30 (23)	645 (393)	14	2·2
Quarries ....	5	3	70	5	} 6·5
Rock-Crushing ....	2	1	23	1	
Potteries and Brickworks ....	3	2	11	0	
Sandblasting company ....	1	1	11	0	0
	52 (26)	27 (23)	760 (393)	20	2·6

\* Includes two second visits.

*Noise.*—The pilot survey commenced last year was completed and a total of 437 employees were subject to audiometric examination (301 last year). Of this total approximately one-third were fitted with ear plugs.

Follow-up revealed that very few, if any, employees were wearing ear plugs for the whole of a working day. The majority who were questioned on the job for various reasons had discarded them completely.

It is apparent that if the wearing of ear plugs is to be successfully attained, then it is essential that a responsible and interested person such as a medical practitioner or a nurse is needed for frequent checking and follow-up. It is noteworthy that this organisation has repeatedly rejected proposals to employ a medical officer.

Surveys of noise levels were undertaken in seven other factories, two on the request of the management. In one the problem was solved by technical advice, from the Commonwealth Acoustic Laboratory, on means of eliminating the noise problem at its source. In four others, ear plugs have either been provided or are to be provided for employees exposed to noise.

(b) *Investigations Undertaken in 1960*

(1) *Survey of Electroplating Shops.*—Seventeen shops were visited by the Physician, accompanied by the Deputy Government Analyst (Government Chemical Laboratories), Safety Liaison Officer (Factories Branch of the Department of Labour).

Electroplating baths were inspected. “Zero-Mist” used in chrome baths was, in the majority of cases, of too low concentration. The management was advised on methods of eliminating chromic acid vapour, either by the *correct* use of “Zero-Mist” or by adequate exhaust ventilation ; and on safe storage of cyanide compounds.

Fifteen shops agreed to order equipment, recommended by this Department, for emergency treatment of cyanide poisoning.

Nineteen electroplaters were interrogated on the job. Fourteen of the 19 gave a previous history of nasal irritation and/or deep ulceration of the skin, especially of the knuckles. Two knew that they had a perforation of the nasal septum ; one of these was recently diagnosed. Only one had a current chrome ulcer.

Employees in the polishing sections were interrogated ; only a small minority considered that their occupation was detrimental to health. Of 48 17 in. x 14 in. chest X-rays in this group, 46 were normal. Two had evidence of early silicosis, but both of them had had previous exposures to silica, one in a foundry and the other in gold and asbestos mines.

(2) *Grain Dust.*—At Geraldton a total of 111 waterside workers and employees of a large grain handling company had 17 in. x 14 in. chest X-rays. Thirty-six employees of the grain handling company, employed in and around a large grain elevator at Fremantle, were also X-rayed. The Geraldton group were exposed intermittently to grain dust (wheat, oats, barley) ; the Fremantle group were, most of them, exposed to grain dust in varying concentrations for most of every working day.

No abnormalities, attributable to exposure to grain, were detected. The survey is not yet complete.



(3) *Phosphine*.—A large grain handling company commenced the use of Phostoxin, which liberates phosphine, in large storage bins in the wheat belt area. Through this Department it was arranged that tests be carried out in conjunction with an analyst from the Government Chemical Laboratories. This, with much attention to detail, was done on five of the bins. It was found that three weeks after fumigation, phosphine levels in the wheat stored in the bins were down to 1·5 p.p.m. or less. The silver nitrate paper test, suitable for field use, was calibrated against a quantitative estimation for phosphine. The company, on the basis of these findings, has worked out a comprehensive routine for the safe handling of “ Phostoxin ”.

(4) *Fruit Fly Spraying with Malathion*.—Towards the end of the summer of 1959–60, some members of a team spraying fruit fly with 0·5 per cent. malathion, complained of vague symptoms such as headache, anotexia, lassitude. One was off work for two weeks, but it was by no means certain that his illness was due to malathion. In September, 1960, when spraying for the season commenced, the Physician, Occupational Health, working with the Department of Agriculture, observed working conditions, advised the men on preventing malathion absorption. He also arranged for a local General Practitioner to take blood from the men at three weekly intervals for cholinesterase estimations at the Public Health Laboratories. Up until the end of 1960 (i.e. after four months), it was found that a falling cholinesterase level served as a salutary warning to the man concerned. There was no evidence of malathion intoxication during this period.

(5) *Benzol*.—Towards the end of 1959, a factory commenced the manufacture of asbestos jointing. This involved the use of benzol during the mixing process. For this, there had been installed exhaust ventilation which, however, had the disadvantage of exhausting air from the mixer across the breathing zone of the operator. Mixing was intermittent and each mix took about 15–20 minutes to complete. Benzene up to 200 p.p.m. was present in the breathing zones of the operators.

Respirators with cartridges specifically designed for benzene vapour were recommended and used. Also arrangements were made for a local practitioner to organise regular blood and liver function tests and clinical examinations when indicated.

Early in the year, one man was found to have abnormal liver function tests which in the absence of any other causative factor, were considered to be due to benzene poisoning. He was clinically well, and following a period of several weeks off work, his liver function tests gradually became normal. Not long after this, ventilation was improved. In addition, urine sulphate tests have been performed at intervals, as a guide to benzene absorption especially on hot days. At the end of 1960, no further case of poisoning had occurred.

## 2.—INVESTIGATION OF CURRENT PROBLEMS

These were referred by the Factories Branch of the Department of Labour, employers, employees, unions, medical practitioners. Though the majority related to the inhalation of toxic gases, vapours or dust, four concerned noise (included under (a) above) ; one concerned death following extensive burns due to ignition of ethyl methyl ketone ; and two sources of ionising radiation.

In the course of these investigations, the Physician visited 37 places of work and three private homes.

## 3.—EDUCATION

Fifth year medical students were given six lectures in Occupational Health ; fortnightly lectures to factory inspectors were continued.

Two lectures were given in each of three terms to executives and foremen undertaking an industrial safety course. This was organised by the Safety Liaison Officer of the Factories Branch of the Department of Labour.

Sixteen items were contributed to meetings of the Industrial Hygiene Committee of the National Health and Medical Research Council.

The close co-operation with the Factories Branch of the Department of Labour, Government Chemical Laboratories, and the Commonwealth Acoustic Laboratory has continued. This has made possible steady progress in the standard of occupational health in this State.

## Appendix XIX

### ANNUAL REPORT OF THE PUBLIC HEALTH DEPARTMENT OF MEDICAL PHOTOGRAPHY

*Commissioner of Public Health*

I have the honour to report on activities for the year ending December, 1960.

A service of medical photography and illustration was given to :—

- (1) Princess Margaret Hospital.
- (2) King Edward Memorial Hospital.
- (3) Fremantle Hospital.
- (4) Perth Chest Hospital
- (5) Public Health Department.
- (6) Public Health Laboratory Service.
- (7) St. John of God Hospital.
- (8) Medical practitioners in private practice.

and a work increase of 33 per cent. was shown over the previous year. This work has been facilitated by the provision of an extra darkroom for printing purposes.

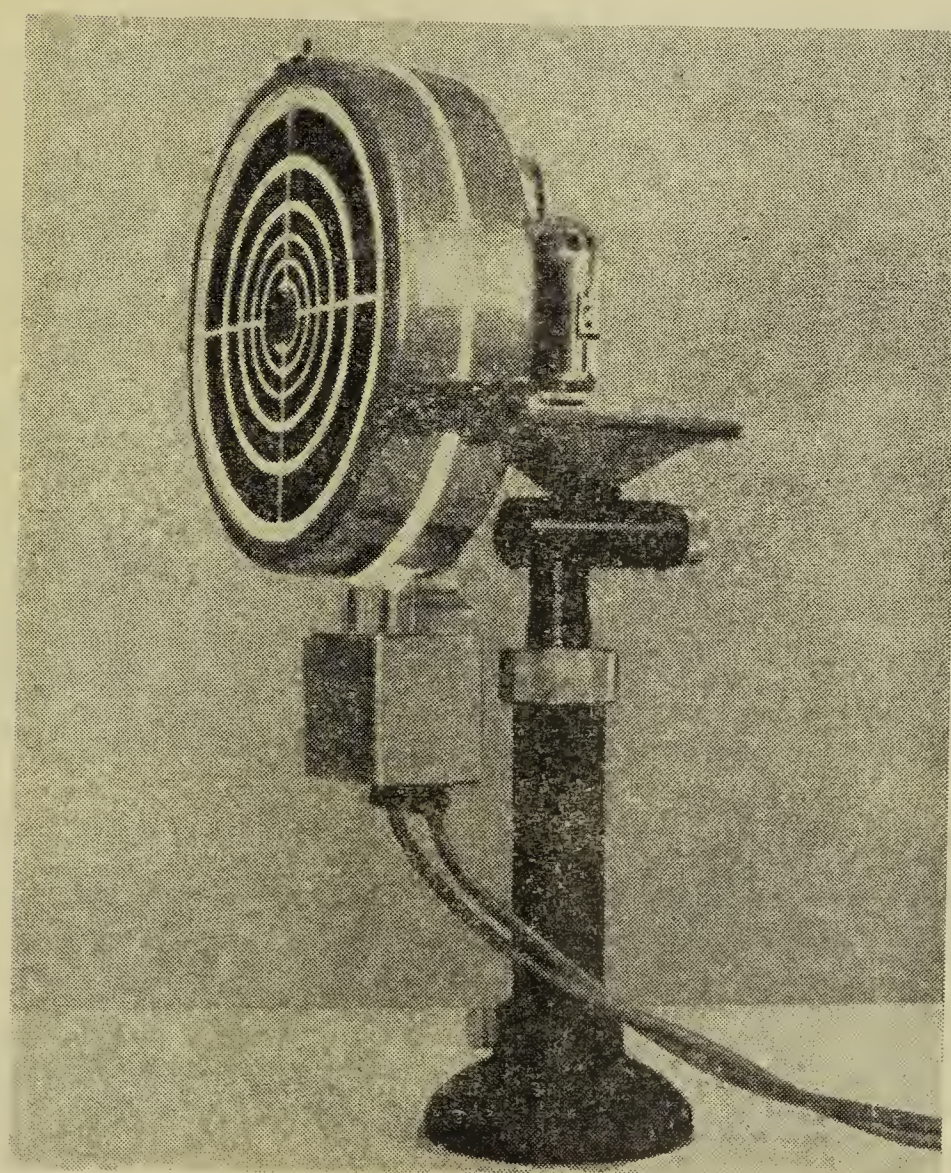
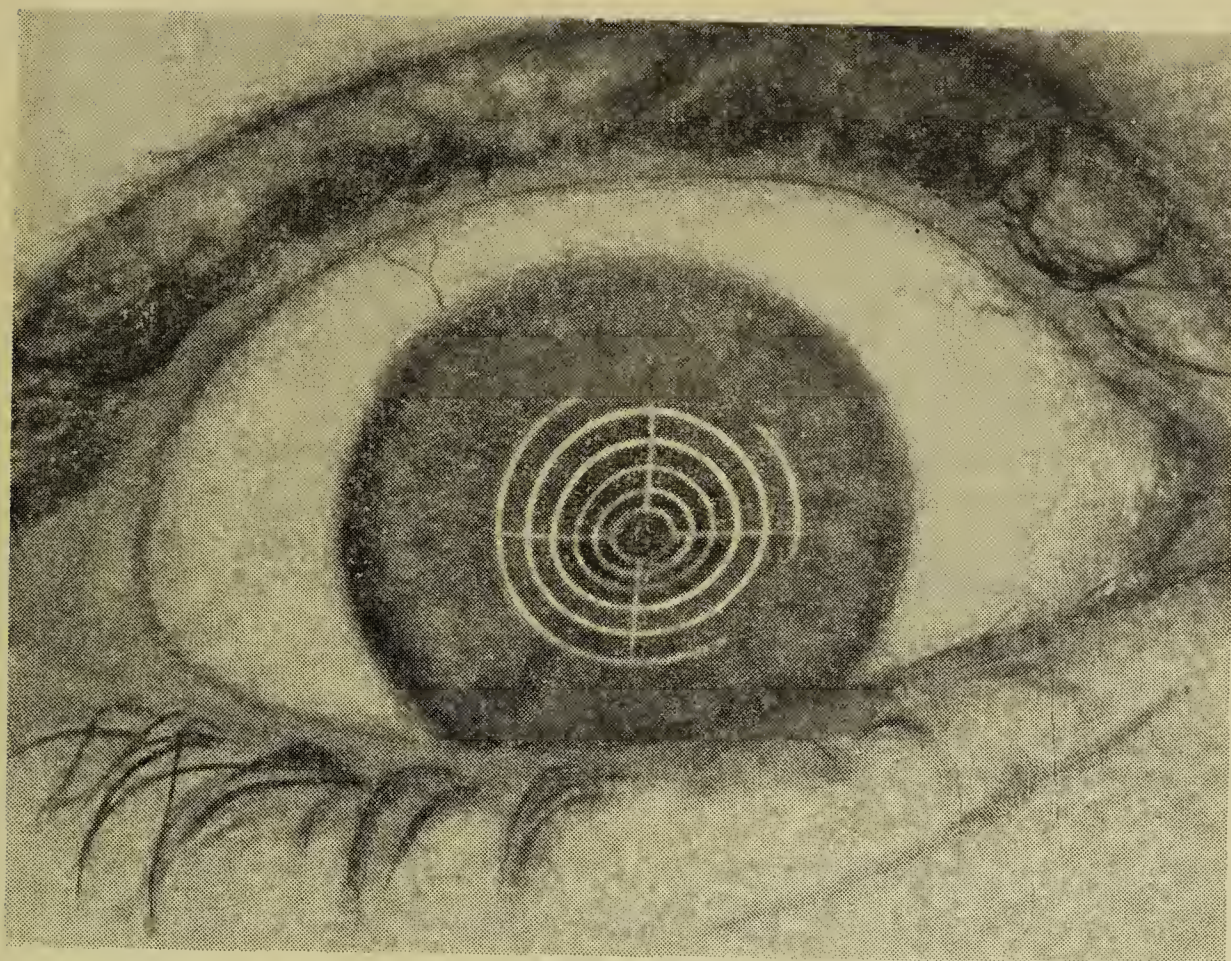
No requests for work are refused and a photographer is available constantly, the only delay being travelling time. This central department concerned solely with medical illustration thus provides a prompt and efficient service at a cost which could not be equalled, should the public hospital concerned institute resident departments of medical photography.

Experimental work continued on a small scale, and a paper, "A method for Keratographic recording," with Dr. A. Lamb as co-author, was accepted by the British Journal of Ophthalmology for publication in May, 1961. The apparatus constructed, provides a photographic method of giving the radius of curvature of the cornea to an accuracy of 0·2 millimetres, as well as atopographical record of the contour. The apparatus and typical photographic record are shown in Figs. 1 and 2. An apparatus for photographing and viewing the uterine cervix was constructed and used successfully in the Gynaecological clinics at Fremantle Hospital. This was done in conjunction with cytological investigation, and could be considered of value in the detection of malignant neoplasms of the cervix. The apparatus and technique is the subject of a paper to be published by the British Medical Association in January, 1962.

The requirements from the Public Health Laboratory Service have considerably increased since the appointment of the Director. In addition to routine laboratory photography, work commenced on a photographic survey of the scale pattern of human hair for the Public Health Laboratories Forensic Medicine Section.

R. PLUMMER,  
Senior Medical Photographer.







Appendix XX

INFANT HEALTH SERVICE

To the Commissioner of Public Health

I have the honour to submit to you a report on the work done by the Infant Health Service, including Pre-School Health, for the year 1960.

During 1960 75 per cent. of all babies born in the State whose births were notified to the Infant Health Service attended Infant Health Centres.

A total of 14,599 Birth Notifications were received by the Infant Health Service, 216 fewer than 1959, including 614 received by the Correspondence Department.

The gross attendance at Infant Health Centres was 221,619 fewer than 1959, but individual attendances were 27,801, 319 more than 1959.

Hospital visiting has been continued in 1960 with an excellent response. A total of 16,707 visits were paid to Mothers and Babies in hospital, 5,568 more than in 1959.

First home visits paid were 9,445. Subsequent visits paid to homes were 11,211, making a total of 20,656 which was 138 fewer than 1959.

Analysis of Work Done in Infant Health Centres

Individual attendance at regular Infant Health Clinics	....	....	27,801
Individual attendance at Pre-School Clinics	....	....	2,474
Gross attendance at Infant Health Centres	....	....	221,619
Gross attendance at Pre-School in Infant Health Centres	....		3,980
Hospital visits	....	....	16,707
Home visits (first)	....	....	9,445
Home visits (subsequent)	....	....	11,211
Advice by letter	....	....	740
Advice by telephone	....	....	7,083
Children referred to doctors	....	....	2,308
Mothers referred to doctors	....	....	283
Expectant Mothers seen at Infant Health Centres	....	....	160
Mothercraft lectures by Country Sisters	....	....	217

Infant Health Centres in the State at the end of 1960

	Main Centres	Sub- Centres	Stopping Places
Metropolitan	35	95	....
Country	24	181	....
Caravans	4	....	114

There are now 124 Infant Health Centre Buildings which meet the standard required. There are still a great many sub-standard buildings being used for Infant Health work and they are not included in this figure.

The figure 181 sub-centres in the country, 10 less than 1959, is due to the fact that before the end of 1960 it was found necessary to cut down travelling time and visits in several country areas and concentrate Sisters' work in the larger Centres visited. Several Metropolitan Centres were visited by Medical Students, Dietitians from Royal Perth Hospital, Trainees from King Edward Memorial Hospital. Infant Health Trainees from Ngal-a were assigned to Metropolitan and Country Centres. Dr. Hewitt attended on a number of occasions at Centres to demonstrate to Medical Students and to Infant Health Trainees.

In 1960 New Buildings were Opened at

- Flinders Street (Mt. Yokine)
- Blythe Avenue (Mt. Yokine)
- Wembley Downs
- Brentwood
- Ardross
- Claremont (to replace the old Centre)
- Cowaramup.



*Centres which it is hoped to build in 1961*

Dalwallinu (with quarters)  
Kojonup (with quarters)  
Beachlands (with quarters)  
Millen  
Mt. Hawthorn (No. 2)  
Floreath Park  
Nollamara  
Lockyer (Doctor's surgery being renovated to make a Centre)  
Brunswick Junction.

Unfortunately Wyalkatchem and Geraldton Centres were closed for short periods because of staff shortages.

*Staff*

There are 73 full-time Sisters on the Staff including two full-time Pre-School Sisters and also three part-time Sisters and two part-time relieving Sisters.

I regret to have to record the death of Dr. A. Eksteins, Medical Officer Kindergartens, who died during the year. Dr. Eksteins gave much valuable service to the Department. His delightful personality and his wonderful approach to small children will be greatly missed in the Kindergartens where he was most popular. Dr. Ethel Roberts was appointed to the position in September.

*Long Service Leave*

Sisters Lewin, Hicks, Hawkins, Davey, Green.

Sister Formby who had given valuable service to Infant Health retired during the year.

Sister Muller (nee Boyd) rejoined the staff.

*Native Reserves*

Allawah Grove is visited regularly by our Infant Health Sister. The response from Mothers is still good.

Sister A. Smith from the United Aborigines Mission is getting a good response to her work at Gnowangerup, Borden, Ongerup and Tambellup Reserves.

*Correspondence Section*

There has been a further increase in the work of this section. A part-time Sister was added to the staff, but if the work increases because of the demand from both schools and individuals, it will be necessary to increase the staff in 1961 by one Sister, when a suitable appointee has been found, and another typist.

Owing to pressure of work it was found impossible to make the third film it was hoped to make in 1960. However, the script is ready and Visual Education is prepared to make the film early in 1961.

Seven extensive country trips were made during the year including trips to the North-West, Murchison, Eastern Goldfields and Missions in the South-West. On all of these trips the Sisters were alert for any signs of Trachoma or malnutrition.

The response of the people to the Sisters' visits to these far distant places is really remarkable. It is to be hoped that another Sister suitable for this type of work and interested in the native question will be found early in 1961.

The following places were visited :—

Gnowangerup, Mt. Barker, Cranbrook, Marribank, Wagin, Narrogin, Shark Bay, Broome, Derby, Fitzroy Crossing, Gogo, Marble Bar, Port Hedland, Sunday Island, Wyndham, Hall's Creek, Moolabulla, Kimberley Research Station, Camps, etc., Forrest River Mission, Wittenoom, Roebourne, Port Samson, Onslow, No. 6 Pump, Yellowdine, No. 7 Pump, Barrabbin, No. 8 Pump, Bullabulling, Kurrawang, Menzies, Mt. Magnet, Laverton, Cosmo Newbery, Leonora, Gwalia, Mt. Ida, Agnew, Yakabindie, Wiluna, Wiluna Mission, Sandstone, Youanmi Downs, Paynes Find, Mt. Margaret, Meekatharra, Doolgunna, Jigalong, Nullagine, Three Rivers, Cue, Yalgoo, Wubin.

INFANT HEALTH CORRESPONDENCE SERVICE  
ANNUAL REPORT

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Figures
Births Reported .....	151	163	190	110	614
New Babies .....	77	147	170	158	552
Requests for Advice <i>re</i> Babies .....	798	864	1,034	1,082	3,778
Individual Babies .....	321	436	442	466	1,001
Pre-School Children—Advice <i>re</i> .....	100	445	362	302	1,209
Pre-School Children—Individual .....	38	436	338	275	991
Expectant Mothers—Advice <i>re</i> .....	55	130	115	88	388
Expectant Mothers—Individual .....	36	72	59	45	212
Extra People Seen—Children's Eyes, etc. ....	....	....	....	552	552
Weigh Centres—Attendances .....	462	322	504	582	1,870
Letters Received—					
Mothers .....	278	259	328	361	1,226
Others .....	154	178	177	147	656
School Children....	443	1,492	1,857	1,909	5,701
School Children Lessons .....	438	1,579	1,955	2,015	5,987
Letters Sent—					
Mothers .....	1,209	1,079	1,266	1,176	4,730
Others .....	301	343	322	293	1,259
School Children....	539	978	991	883	3,391
School Children Lessons .....	1,138	2,070	2,579	1,028	6,815
Visits to Homes—Country .....	....	167	156	74	397
Visits to Hospitals—Country .....	....	21	2	1	24
Visits to Centre—Country Visitors—					
Babies .....	73	51	46	39	209
Pre-School .....	29	20	14	15	78
Expectant Mothers .....	15	1	2	5	23
School Children....	271	....	1	90	362
School Teachers .....	31	1	....	2	34
Others (in connection with Correspondence work)	144	36	30	31	241
Groups shown over Centre, Lectures and Demonstrations—					
Country .....	2	7	10	14	33
Perth .....	(88 people)	(373 people)	(408 people)	(659 people)	(1,528 people)
Number of Children from whom Mothercraft has been					
received .....	158	291	289	303	380
Mothercraft children visited in Country Schools during					
year .....	....	....	....	....	326
Telephone Conversations—Inward—Consultations with					
Country Mothers only .....	24	19	14	14	71
Country Trips made during the year .....	....	....	....	....	7

MOTHERCRAFT SECTION

There are still only three Mothercraft Lecturers but a further part-time Sister is urgently necessary for the first two terms of each year. Work in this field could be expanded to other new metropolitan schools if a suitable lecturer were available. Sister Kerr, the Senior Lecturer, is so committed to her work with Parents and Expectant Mothers, Broadcasts and Television which she really could easily extend in this field and leave the lecturing in Metropolitan Schools to the other members of the Mothercraft Section.

Sister Kerr demonstrates to Medical Students and is also the State Examiner in Mothercraft at Ngali. Sister Brady is the “House” examiner at Ngali.

This is a very busy Section of the Infant Health Service but I would like to see it expanding. All three Sisters prepare material for broadcasting.

SUMMARY OF LECTURES GIVEN

Lectures given to Pupils and Students of High Schools and Colleges and Women's Organizations in the Metropolitan area.

	No. of Classes	Lectures	Exams	Pupils
<i>High Schools—</i>				
Lecturer—Sr. Kerr .....	9	79	....	181
Sr. Brady .....	25	186	....	408
Sr. Parnell .....	24	179	1	571
<i>Private—</i>				
Lecturer—Sr. Kerr .....	1	10	1	31
Sr. Brady .....	7	58	7	199
Sr. Parnell .....	3	25	3	91
<i>Trainee Teachers—</i>				
Lecturer—Sr. Kerr .....	3	23	3	42
<i>Technical College—</i>				
Lecturer—Sr. Kerr .....	1	9	1	18
Sr. Brady .....	2	14	2	48
Sr. Parnell .....	1	7	1	14
	76	590	19	1,603



<i>Organizations—</i>					No. of Classes	Lectures	Exams	Pupils
Home of the Good Shepherd—Sr. Kerr ....					3	32	....	36
Cockburn Rangers—Sr. Kerr ....					1	10	1	9
G.F.S., Scarborough—Sr. Kerr ....					1	8	1	20
Baptist Girls' Club—Sr. Kerr ....					1	7	....	16
St. John's Ambulance Cadets—Sr. Brady					1	7	....	19
St. John's Ambulance Cadets—Sr. Parnell					1	5	....	25
					84	659	21	1,728
<i>Country Schools</i> ....					34	217	6	683
GRAND TOTAL ....					118	876	27	2,411

### Transline Trips

Four trips were made in 1960. The total number of persons seen was 1,141. The number of individual babies under two seen was 301. The number of individual pre-school children seen was 107. The Sisters continue to carry out immunisation along the line—315 persons were immunised. Sister Parnell was able to do some relieving in Infant Health Centres during the last term.

## SUMMARY OF WORK ON TRANS LINE

### TRANS LINE “TEA AND SUGAR TRAIN” TRIPS FOR 1960

#### *Sisters Brady and Parnell*

		0-2 years		3-6 years		7-14 years		Expectant Mothers		Others		Individuals seen		Vaccines		Total of People
		Owd.	Ret.	Owd.	Ret.	Owd.	Ret.	Owd.	Ret.	Owd.	Ret.	Owd.	Ret.	Salk	Others	
February	W.A.	26	17	6	8	....	8	1	2	11	10	44	46	21	11	153
	S.A.	4	33	2	12	....	9	....	3	15	10	12	76	46	5	137
May	W.A.	26	15	7	3	4	8	4	....	16	15	57	41	35	10	147
	S.A.	13	18	3	4	5	6	2	1	....	2	23	31	23	3	88
Aug.-Sept.	W.A.	25	18	9	7	4	4	3	1	21	14	62	44	29	12	177
	S.A.	7	31	....	16	1	7	....	2	10	32	18	88	57	2	177
December	W.A.	17	9	13	2	....	....	2	....	20	12	52	23	15	5	120
	S.A.	11	31	1	14	....	6	1	2	3	14	16	67	39	2	142
		129	172	41	66	14	48	13	11	96	109	284	416	265	50	1,141
		301		107		62		24		205		700				

### Caravans

The four Caravans (114 stopping places) continue to give good service in the outer-metropolitan districts. As usual there were frequent mechanical breakdowns which cause great inconvenience to Mothers who may be waiting at the roadside for the Sister. One of the Pre-School Sisters has been conducting a Pre-School Clinic each month on the Armadale Caravan. The response by the Mothers to this extra service has been beyond expectations.

### Pre-School Section

An additional service in the Pre-School Section in which the family doctor was invited to participate was begun as a pilot scheme in three metropolitan areas in August, 1960. Reports to hand already show that both the Mothers and their family doctors are enthusiastic about the scheme. This scheme was prepared by Professor W. B. Macdonald of the Department of Child Health and implemented by this Department. In August, 1961, an evaluation of the scheme will be made before it gradually becomes routine practice, first in the metropolitan area and then, as soon as more staff is available, in the country areas.

The Curriculum for the Pre-School Course prepared in 1959 has been accepted by the Nurses Registration Board. It is hoped to have a Pre-School Course for Infant Health Sisters in 1961.

*Pre-School Section 1 (Kindergartens)*—Owing to the death of Dr. A. Eksteins no Kindergarten Medical examinations were carried out for one whole term (May-September). Sister Rogers did extremely useful work visiting the Kindergartens carrying out the tests on eyes and ears and doing hygiene and also keeping in touch by home visits and interviews with parents.

KINDERGARTEN REPORT

Metropolitan area one visit	....	....	....	....	....	88
Metropolitan area two visits	....	....	....	....	....	88
Country visits	....	....	....	....	....	2
Total number of visits to Kindergartens	....	....	....	....	....	178
Total number of children examined	....	....	....	....	....	4,215
Conditions notified to Parents	....	....	....	....	....	1,417
Referred for medical attention	....	....	....	....	....	525
Referred for Home attention	....	....	....	....	....	411
Referred for Dental attention	....	....	....	....	....	481
Number of children not immunised	....	....	....	....	....	69
Underweight children	....	....	....	....	....	45
Pediculosis	....	....	....	....	....	....
Parents interviewed	....	....	....	....	....	237
Home visits	....	....	....	....	....	260

*Pre-School Section 2*—One of the Pre-School Staff, Sister B. Wells, was given a year's leave of absence in order to take a course at Heathcote in Psychiatric Nursing (Sister completed this Course with Credit). Several of the Sisters who have already done the Pre-School Course (Old Curriculum) agreed to give time each week at their own Centres for this special work. The results were most encouraging and are shown in another part of this report. Two full-time Pre-School Sisters carried on the work in certain Centres where the Infant Health Sisters had not done a pre-school course.

Total number seen	....	....	....	....	....	....	2,857
Individuals	....	....	....	....	....	....	1,716
Home visits	....	....	....	....	....	....	123
Letters written	....	....	....	....	....	....	270
Broadcasts prepared	....	....	....	....	....	....	26

*Annual Refresher Course*

Refresher Course for 1960 was held from 1st to 5th August. All the Infant Health Sisters were present except the Sister from Broome and the Sister who is employed part-time at Esperance. It is hoped that both these Sisters will be able to be present at the 1961 Refresher Course. The Sisters find the Course and discussions so valuable and stimulating that it is a misfortune for any Sister to be unable to participate in the Course.

In the absence of the Commissioner of Public Health, Dr. L. Henzell who was on Long-Service-Leave, Dr. W. S. Davidson, Acting Commissioner, presided at the inaugural session. Refresher Week was declared open by the Hon. the Minister for Health.

Professor Macdonald gave the first lecture which was much appreciated by all who heard it. Professor Macdonald's sound and helpful advice continue to be greatly appreciated by the Infant Health Service.

The Infant Health Service is very much indebted to all the lecturers who give their valuable time so willingly in the preparation and delivery of lectures at the Annual Refresher Course.

*Visitors to Infant Health Headquarters during 1960*

Dr. Margaret Whitty—Oxford. Professor S. T. Achar and Miss S. Achar, Madras. Dr. M. Hobday, Pakistan. Miss Jenny Naro, Sourabaya, Indonesia. Dr. L. O. Roberts, W.H.O. Dr. J. B. Matheson, Director of Commonwealth Health. Mr. and Mrs. J. B. Crawford, Norwich, England. Mrs. Catherine King, A.B.C., Perth. Mrs. D. Grey, Edinburgh.

*Ngal-a Trainees*

Three Ngal-a Trainees joined the Infant Health Staff in 1960. It is hoped that more young Sisters from this Training School will join the Staff in 1961.

*Phenylketonuria*

Tests for Phenylketonuria were begun as a routine in all Infant Health Centres in August, 1960. Every new baby who is taken to a Centre has its urine tested either at the first visit or as soon as possible after the first visit. Up until 31/12/60, 5,306 tests were made.

*Lotteries Commission*

Infant Health is very much indebted to the Lotteries Commission for all the help that is so generously given to Infant Health projects. If it were not for the generosity of the Commissioners, Infant Health in W.A., would not be in the good position it is today with regard to proper buildings and Baby Scales.

*Infant Health Committees*

There are still many Committees throughout the State working hard for projects such as Centre Buildings, Toddlers Scales, furnishing for Centres, etc. Many Mothers and Babies owe a great debt of gratitude to Committee Members throughout the State for such untiring efforts on their behalf.



### *Infant Health Headquarters*

The fact that the staff is still divided, one section at 1120 Hay Street and the other at 6 Ord Street, is to be regretted. Such a division is far from satisfactory. It is to be hoped that the necessary extension to 1120 Hay Street will be begun in 1961. Plans have already been prepared for the extension.

### *T.V. Session*

A monthly television session on Infant Health was begun in November, 1960. The first of the series was an interview with an expectant Mother who when her baby arrives will bring it each month to consult an Infant Health Sister.

### *Broadcasts*

One broadcast each week is given from Perth, Geraldton and Kalgoorlie. A monthly clinic-of-the-air is broadcast over the Flying Doctor Network from Carnarvon and Sister Philbin speaks to far outback Mothers from the Meekatharra, Wyndham and Port Hedland Flying Doctor bases. From the numbers of Mothers who "come in" to ask questions and who say "thank you! we enjoyed your talk," it seems that this part of the Infant Health work serves a very useful purpose.

### *Teaching Ngal-a Trainees and Medical Students*

Dr. Gwen Hewitt received a part-time appointment with the Infant Health Service during 1960. Dr. Hewitt lectures to the Trainees at Ngal-a and demonstrates to Medical Students and Infant Health Trainees at the Infant Health Centres.

### *Conclusion*

In conclusion I wish to record my sincere thanks to the Medical and Nursing Staff of the Infant Health and Pre-School Health Service for another year of loyal and conscientious service to the Mothers, Babies and Pre-School Children in this State, the results of which are recorded in this report.

ELIZABETH M. GIBSON,  
Medical Supervisor of Infant Health.

Centre	Gross Number of Attendances					Individual Babies Attended					Birth Notifica- tions Re- ceived	New Babies	Transfers from Other Centres	Visiting Babies	Individual Expectant Mothers
	Under 12 Months	1-2 Years	Total 1 + 2	Over 2 Years	Grand Total 3 + 4	Under 12 Months	1-2 Years	Total 6 + 7	Over 2 Years	Grand Total 8 + 9					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Albany	3,611	138	3,749	56	3,805	375	70	445	16	461	295	251	16	44	9
Applecross	4,389	186	4,575	24	4,599	463	70	533	24	557	290	265	18	37	3
Bassendean	4,053	228	4,281	6	4,287	361	122	483	6	469	249	223	30	33	2
Bayswater	4,991	186	5,177	...	5,177	446	23	469	...	469	321	286	39	78	...
Beverley	1,746	142	1,888	84	1,972	209	58	267	43	310	177	157	18	11	13
Boulder	3,076	217	3,293	130	3,423	236	74	310	61	371	315	224	15	32	4
Broome	879	374	1,253	1,314	2,567	98	41	139	198	337	36	60	2	17	74
Brodgetown	2,873	274	3,147	82	3,229	288	101	389	59	448	193	166	18	16	1
Bruce Rock	3,027	93	3,120	21	3,141	351	40	391	16	407	238	224	21	38	12
Bunbury	4,793	213	5,006	62	5,068	497	123	620	44	664	325	289	26	37	...
Busselton	3,841	424	4,265	52	4,317	342	129	471	15	486	260	227	...	64	...
Carnarvon	380	85	465	43	508	57	45	102	38	140	98	68	4	6	19
Caravan No. 1	4,439	481	4,920	182	5,102	235	191	426	53	479	237	212	26	19	8
Caravan No. 2	2,433	167	2,600	41	2,641	201	69	270	28	298	134	133	12	19	...
Caravan No. 3	3,099	261	3,360	64	3,424	511	152	663	55	718	119	120	7	29	36
Caravan No. 4	3,774	274	4,052	29	4,081	155	94	249	4	253	165	166	4	19	16
Claremont	4,741	393	5,134	66	5,200	344	147	491	344	523	260	250	15	120	...
Cloverdale	1,134	114	1,248	208	1,456	190	104	294	199	493	147	110	10	6	16
Collie	2,251	290	2,541	185	2,726	324	150	474	120	594	180	127	4	17	50
Corrigin	3,038	1,071	4,109	826	4,935	186	106	292	105	397	209	207	...	11	71
Cottesloe	4,671	287	4,958	21	4,979	249	174	423	18	441	234	248	46	59	21
Doubleview	3,356	173	3,529	26	3,555	496	75	571	22	593	219	245	25	71	11
Esperance	833	137	970	88	1,058	50	31	81	5	86	50	54	11	19	21
East Victoria Park	4,378	204	4,582	118	4,700	334	54	388	87	475	217	252	33	58	...
Fremantle	4,248	142	4,390	15	4,405	496	45	541	13	554	402	346	22	48	...
Gosnells	2,830	257	3,087	439	3,526	236	103	339	294	633	196	155	13	21	1
Gerulston	4,385	154	4,539	40	4,579	466	103	569	16	585	370	327	21	31	...
Hackett Estate	2,885	185	3,070	8	3,078	169	80	249	8	257	158	195	28	14	21
Harvey	3,087	86	3,173	16	3,189	322	29	351	10	361	219	213	6	15	2
Inglewood	4,049	158	4,207	5	4,212	470	94	564	5	569	259	259	34	91	7
Kalgoorlie	3,583	370	3,953	276	4,229	320	206	526	88	614	364	312	15	97	1
Kalamunda	3,006	225	3,231	63	3,294	345	94	439	25	464	222	158	36	20	5
Katanning	2,545	138	2,683	67	2,750	375	29	404	42	446	278	203	16	20	2
Keatington	3,768	64	3,832	2	3,834	306	69	375	...	375	246	225	20	28	...
Kensington	2,966	247	3,213	122	3,335	236	137	373	96	469	193	192	18	37	68
Kellerberrin	4,204	460	4,664	178	4,842	337	143	480	56	536	256	254	37	66	69
Leederville	2,797	280	3,077	60	3,137	262	37	299	30	329	267	247	10	21	23
Manjimup	3,874	248	4,122	11	4,133	416	33	449	9	458	278	235	21	...	...
Melville	4,622	435	5,057	45	4,802	437	89	526	35	561	293	321	23	42	...
Maylands	3,480	155	3,635	9	3,644	353	78	431	6	437	260	218	20	55	...
Midland Junction	3,440	462	3,902	307	4,209	244	176	420	114	534	265	244	29	26	23
Mingenew	3,806	97	3,903	13	3,916	421	47	468	4	472	304	257	74	201	3
Mt. Hawthorn	1,505	168	1,673	276	1,949	162	100	262	57	319	153	140	13	23	20
Mt. Barker	3,545	202	3,747	95	3,842	217	147	364	58	422	236	187	28	54	...
Mosman Park	3,243	316	3,559	195	3,754	454	82	536	38	574	274	262	31	55	33
Moora	2,622	292	2,914	130	3,044	435	133	568	66	634	251	228	12	14	...
Narrogin	2,260	195	2,455	114	2,569	271	76	347	75	422	253	211	15	36	...
Northam	3,805	173	3,978	8	3,986	519	37	556	8	564	280	284	58	70	...
North Perth	3,401	132	3,533	2	3,535	411	107	518	2	520	448	260	29	43	...
Osborne Park	2,989	211	3,200	95	3,295	401	36	437	24	461	297	233	48	158	56
Perth	2,441	183	2,624	16	2,640	163	63	226	12	238	175	121	13	99	...
Pinjarra	4,232	85	4,317	...	4,325	476	30	506	...	506	477	322	33	67	6
Rivervale	2,136	153	2,289	38	2,327	199	79	278	22	300	135	107	18	41	15
Rockingham	3,970	127	4,097	...	4,097	354	74	428	...	428	252	232	23	33	29
Scarborough	4,431	248	4,679	57	4,736	392	17	409	3	412	251	244	25	58	34
South Perth	3,606	268	3,874	450	4,324	273	166	439	349	788	157	171	37	49	13
Subiaco	652	...	652	...	652	69	...	69	...	69	18	22	...	...	...
Swanbourne	3,062	180	3,242	...	3,242	316	52	368	...	368	135	155	32	205	...
Victoria Park	3,797	144	3,941	15	3,956	315	67	382	...	393	249	208	28	35	21
Wembley	2,286	147	2,433	32	2,465	299	55	354	11	370	270	217	6	11	...
Wagin	811	83	894	89	983	63	40	103	37	140	49	67	4	18	24
West Perth	4,515	119	4,634	13	4,647	446	59	505	6	511	272	242	31	100	...
Willagee	2,020	61	2,081	6	2,087	194	22	216	3	219	169	180	10	11	...
Wyalkatchem	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Totals for Year	200,710	13,766	214,576	7,043	221,619	19,638	5,277	24,915	2,886	27,801	14,599	13,018	1,324	2,873	864



Centre	Medical Visits										In- effective (26)	Total 23-26 (27)	Advice by Letter (28)	Advice by Tele- phone (29)	Mother Referred Corres- pondence Sister (30)	Lectures Given (31)	Group Demon- strations (32)			
	Doctor			Hospital			Total											Home		
	Baby Referred (16)	Mother Referred (17)	Baby Referred (18)	Mother Referred (19)	Babies Referred 16 + 18 (20)	Mothers Referred 17 + 19 (21)	Hospital (No. of Babies) (22)	To Babies, First (23)	To Babies, Sub- sequent (24)	Expect- ant Mothers (25)										
Albany	52	12	...	...	52	12	306	188	180	8	376	1	76	3	12	4				
Applecross	10	2	...	...	10	2	4	293	530	1	829	...	418	...	...	...				
Bassendean	11	...	...	2	11	2	...	181	82	...	304	...	20	1	...	...				
Bayswater	27	...	...	...	27	...	...	300	39	...	370	...	33	1	...	...				
Beverley	25	7	...	...	26	7	134	70	53	12	143	26	115	12	16	21				
Boulder	93	8	...	...	93	8	680	106	20	...	126	4	38	30	14	2				
Broome	30	8	...	1	30	9	103	20	4	...	35	47	36	4	...	...				
Bridgetown	7	1	...	...	7	1	156	19	124	11	148	...	114	2	7	...				
Bruce Rock	54	...	...	...	54	...	358	34	18	...	52	...	...	...	...	...				
Bunbury	40	...	...	...	40	...	448	253	77	...	383	...	12	...	28	...				
Busselton	34	...	...	...	34	...	212	57	23	...	92	...	3	11	10	...				
Carnarvon	5	1	...	...	7	1	40	64	24	3	104	8	18	...	...	...				
Caravan No. 1	70	9	...	...	70	9	...	158	100	3	287	20	39	1	...	...				
Caravan No. 2	31	4	...	...	33	4	105	42	118	2	201	...	2	...	...	...				
Caravan No. 3	26	5	...	...	29	5	...	123	1,550	...	1,685	...	67	...	...	...				
Caravan No. 4	11	...	...	...	11	...	203	...	...	...	...	...	...	...	...	...				
Claremont	21	...	3	...	24	...	...	237	211	...	490	...	...	...	...	...				
Cloverdale	11	1	...	...	11	1	...	166	175	1	376	...	...	...	...	...				
Collie	39	39	...	...	39	39	202	197	259	58	514	52	127	8	16	16				
Corrigin	88	...	...	6	88	6	232	13	202	...	215	...	99	...	...	...				
Cottesloe	16	5	...	...	16	5	694	241	69	...	316	...	191	...	...	...				
Doubleview	59	2	...	...	59	2	...	199	215	3	417	...	402	8	9	...				
Esperance	3	4	...	...	3	4	48	18	48	2	68	...	1	...	...	...				
East Victoria Park	32	3	...	...	32	3	...	205	122	...	370	...	73	2	...	...				
Fremantle	58	8	...	...	58	8	757	359	374	...	737	...	138	...	...	...				
Gosnells	19	4	...	...	19	4	...	111	751	...	909	...	...	...	...	...				
Geraldton	16	...	...	...	16	...	358	28	32	...	75	...	...	...	...	...				
Hackett Estate	91	6	...	...	91	6	...	180	571	13	841	...	77	...	...	...				
Harvey	18	1	...	...	18	1	135	6	46	...	52	...	2	5	16	...				
Inglewood	28	1	...	...	28	1	...	196	41	...	261	...	52	...	...	...				
Kalgoorlie	67	18	...	...	67	18	...	342	24	...	395	...	267	...	12	...				
Kalamunda	43	8	...	...	43	8	...	79	213	...	399	...	82	...	...	...				
Katanning	9	2	...	...	9	2	224	38	68	2	125	1	20	9	12	...				
Kensington	9	...	...	...	9	...	55	245	63	...	328	...	386	...	...	...				
Kellerberrin	82	...	...	...	82	...	164	49	126	...	179	18	81	1	...	...				
Lederville	29	...	...	...	40	...	239	262	253	...	605	...	248	1	...	...				
Manjimup	33	6	...	...	34	6	235	63	81	...	871	...	17	6	8	...				
Melville	28	2	...	...	28	2	...	272	599	...	871	...	468	...	...	...				
Maylands	12	2	...	...	12	2	...	246	60	...	404	...	51	5	...	...				
Midland Junction	12	...	...	...	12	...	454	95	50	...	158	...	...	...	...	...				
Mingenew	69	15	...	2	80	17	234	16	87	15	123	12	135	1	10	1				
Mt. Hawthorn	23	3	...	...	23	3	2,822	250	313	...	569	...	53	1	8	...				
Mt. Barker	35	8	...	1	36	9	79	20	94	9	126	5	33	2	14	6				
Mosman Park	47	7	...	...	50	7	2,302	216	70	...	286	...	48	...	...	...				
Moora	10	...	...	...	10	...	213	...	34	...	34	...	21	...	...	...				
Narrogin	20	1	...	...	20	1	381	109	142	1	276	...	111	...	12	2				
Northam	12	...	...	...	12	...	289	192	58	...	279	...	69	...	34	...				
North Perth	52	5	...	...	52	5	...	250	119	...	392	2	128	1	...	...				
Osborne Park	5	...	...	...	5	...	...	301	228	...	595	2	13	...	...	...				
Perth	57	9	...	...	57	9	...	287	206	...	527	...	328	...	...	...				
Pinjarra	25	6	...	...	25	6	90	5	51	1	62	...	20	5	...	...				
Rivervale	20	2	...	...	21	2	...	294	98	...	397	1	8	3	...	...				
Rockingham	7	1	...	...	7	1	131	104	62	2	174	...	19	2	20	20				
Scarborough	55	33	...	...	55	33	...	263	395	...	658	...	674	...	...	...				
South Perth	78	7	...	1	79	7	492	229	200	...	510	...	263	...	...	...				
Subiaco	31	1	...	...	38	1	779	224	472	...	707	...	423	...	...	...				
Swanbourne	16	4	...	...	16	4	...	29	14	...	43	...	12	...	...	...				
Victoria Park	6	1	...	...	6	1	796	260	50	...	312	...	328	...	...	...				
Wagin	6	1	...	...	6	1	...	258	117	...	385	...	71	...	...	...				
Wembley	44	3	...	...	44	3	179	33	35	1	69	...	28	9	9	2				
West Perth	2	1	...	...	3	1	1,289	43	58	...	108	...	...	...	...	...				
Willagee	316	...	...	...	316	...	26	286	553	...	855	...	...	...	...	...				
Wyalkatchem	20	4	...	...	20	4	59	21	160	...	197	...	52	...	...	...				
Totals for Year	2,308	283	45	14	2,353	297	16,707	9,445	11,211	160	22,068	740	7,083	136	267	80				

Appendix XXI

Royal Perth Hospital, Fremantle Hospital and Princess Margaret Hospital

ALL PATIENTS DISCHARGED, 1960, IN AGE GROUPS

Age Group					Cases			Total Days Stay in Hospital			Average Number of Days in Hospital	
					Male	Female	Per cent. of Total	Male	Female	Per cent. of Grand	Male	Female
0-14	....	....	....	....	3,763	2,532	29.93	29,748	21,429	15.69	7.91	8.46
15-19	....	....	....	....	517	623	5.42	8,403	5,725	4.33	16.25	9.19
20-29	....	....	....	....	734	1,028	8.38	10,335	9,547	6.10	14.08	9.29
30-39	....	....	....	....	763	1,024	8.50	12,900	12,623	7.83	16.91	12.33
40-49	....	....	....	....	815	941	8.35	15,323	15,518	9.45	18.80	16.49
50-59	....	....	....	....	1,104	927	9.65	22,912	17,707	12.46	20.75	19.10
60-69	....	....	....	....	1,273	1,264	12.06	27,471	27,659	16.90	21.58	21.88
70 and over	....	....	....	....	1,873	1,852	17.71	40,953	47,871	27.24	21.86	25.85
Total	....	....	....	....	10,842	10,191	100	168,045	158,079	100	15.50	15.51
Male and Female					21,033			326,124			15.51	

Daily Bed Average : 893.5.

OPERATION CASES IN AGE GROUPS, 1960

Age Group					Cases			Total Days Stay in Hospital			Average Number of Days in Hospital	
					Male	Female	Per cent. of Total	Male	Female	Per cent. of Grand	Male	Female
0-14	....	....	....	....	1,381	932	10.99	11,646	8,899	6.30	8.43	9.55
15-19	....	....	....	....	279	243	2.48	5,752	2,902	2.65	20.66	11.94
20-29	....	....	....	....	341	555	4.26	6,411	5,078	3.52	18.80	9.15
30-39	....	....	....	....	326	567	4.25	7,409	6,620	4.30	22.73	11.68
40-49	....	....	....	....	346	439	3.73	9,004	8,019	5.22	26.02	18.27
50-59	....	....	....	....	464	412	4.16	11,168	8,355	5.99	24.07	20.28
60-69	....	....	....	....	498	556	5.01	12,236	13,817	7.99	24.57	24.85
70 and over	....	....	....	....	725	679	6.68	19,916	22,601	13.04	27.47	33.29
Total	....	....	....	....	4,360	4,383	41.56	83,542	76,291	49.01	19.16	17.41
Total Male and Female					8.743			159,833			18.28	

Daily Bed Average : 437.9.



PATIENTS DISCHARGED DURING 1960

Item	Disease	International Classification Categories	Number of Cases		Number of days in Hospital		Per cent. of Grand Total	Average Number of days in Hospital		Average Age of Patients		Sex	Results*				
			M.	F.	M.	F.		M.	F.	1	2		3	4	5		
1	Tuberculosis, all forms ....	001-019	30	17	785	281	·33	26·2	16·5	48	33	M.	3	18	5	...	4
2	Syphilis, Gonorrhoea and other Venereal Diseases	020-039	7	14	144	219	·11	20·6	15·6	56	43	F.	...	13	3	...	1
3	Other Infectious Diseases ....	040-138	324	304	3,844	3,009	2·10	11·9	9·9	14	16	M.	...	4	3	...	...
4	Malignant Neoplasms, including those of Lymphatic and Haematopoietic Systems	140-205	683	613	15,031	14,138	8·95	22·0	23·1	63	60	F.	2	11	...	...	1
5	Benign and Unspecified Neoplasms	210-239	128	203	1,518	2,299	1·17	11·9	11·3	38	40	M.	68	239	11	...	6
6	Allergic Disorders ....	240-245	82	117	768	1,141	·59	9·4	9·8	28	36	M.	45	243	11	...	5
7	Diseases of Thyroid Gland ....	250-254	5	40	121	1,478	·49	24·2	36·9	51	46	F.	38	329	159	...	157
8	Diabetes Mellitus ....	260	77	108	1,961	2,811	1·46	25·2	26·0	57	60	F.	36	325	143	...	109
9	Diseases of Other Endocrine Glands	270-277	13	11	191	193	·07	14·7	17·5	32	32	M.	28	66	27	1	6
10	Avitaminosis and other Metabolic Diseases	280-289	45	30	915	649	·48	20·3	21·6	48	48	F.	49	130	22	1	1
11	Diseases of Blood and Blood-forming Organs	290-299	151	108	1,988	1,443	1·05	13·2	13·4	44	53	M.	8	73	...	...	7
12	Mental, Psychoneurotic and Personality Disorders	300-326	319	439	4,431	6,735	3·42	13·9	15·3	40	41	F.	8	102	...	...	...
13	Vascular Lesions affecting Central Nervous System	330-334	207	206	6,563	6,690	4·07	31·7	32·5	65	67	M.	2	3	4	...	2
14	Inflammatory and Other Diseases of Central Nervous System	340-357	184	151	3,853	4,538	2·57	20·9	30·1	37	37	F.	13	21	15	...	9
15	Diseases of Nerves and Peripheral Ganglia	360-369	55	42	1,144	1,097	·69	20·8	26·1	51	52	M.	4	49	20	1	7
16	Diseases of the Eye ....	370-389	356	354	3,890	4,515	2·58	10·9	12·8	36	45	F.	...	7	4	...	2
17	Diseases of Ear and Mastoid Process	390-398	150	144	1,400	1,416	·86	9·3	9·8	12	15	M.	4	100	36	...	70
18	Rheumatic Fever and Chronic Rheumatic Heart Disease	400-416	54	65	1,413	1,724	·96	26·2	26·5	25	26	F.	30	123	22	...	56
19	Diseases of the Heart and Arteries including Hypertension and Arteriosclerosis	420-456	569	483	12,675	11,106	7·29	22·3	23·0	65	66	M.	6	107	58	4	9
20	Diseases of Veins and other diseases of circulatory system	460-468	109	179	1,427	3,337	1·46	13·1	18·6	47	48	F.	13	89	47	...	9
21	Diseases of Respiratory system ....	470-527	1,393	1,054	13,274	8,309	6·62	9·5	7·9	26	25	M.	...	45	10	...	...
													3	35	3	...	...
													37	295	31	...	...
													12	286	30	...	1
													7	131	7	...	...
													3	121	16	...	...
													2	38	8	...	5
													6	46	13	...	4
													17	370	71	1	121
													13	338	47	...	85
													17	78	9	...	5
													41	115	18	...	5
													275	1,011	32	2	73
													251	759	12	...	32

Royal Perth Hospital, Fremantle Hospital and Princess Margaret Hospital  
PATIENTS DISCHARGED DURING 1960—continued

Item	Disease	International Classification Categories	Number of Cases		Number of days in Hospital		Per cent. of Grand Total	Average Number of days in Hospital		Average Age of Patients		Results*					
			Cases		in Hospital			Hospital		Patients		Results*					
			M.	F.	M.	F.		M.	F.	M.	F.	Sex	1	2	3	4	5
22	Diseases of Buccal Cavity and Oesophagus	530-539	57	62	465	631	.34	8.2	10.2	29	29	M.	8	41	8	...	...
23	Diseases of Stomach and Duodenum	540-545	248	121	4,494	2,131	2.03	18.1	17.6	52	58	F.	10	48	4	...	...
24	Appendicitis	550-553	218	214	2,065	1,955	1.23	9.5	9.1	25	26	M.	33	192	12	1	10
25	Hernia of Abdominal Cavity	560-561	240	134	2,722	2,197	1.51	11.3	16.4	48	54	F.	20	84	10	...	7
26	Other Diseases of Intestines and Peritoneum	570-578	299	297	4,379	4,041	2.58	14.6	13.6	32	42	M.	112	104	2	...	...
27	Diseases of Liver and Gallbladder	580-586	116	192	2,804	3,307	1.87	24.2	17.2	57	58	F.	95	118	...	...	1
28	Diseases of Pancreas	587	15	18	387	344	.22	25.8	19.1	45	36	M.	104	115	14	1	6
29	Nephritis and Nephrosis	590-594	54	41	1,248	986	.69	23.1	24.0	24	27	F.	40	78	12	...	4
30	Other Diseases of Urinary System	600-609	184	246	2,215	3,518	1.77	12.0	14.3	46	42	M.	57	210	24	2	6
31	Diseases of Male Genital Organs	610-617	294	...	5,491	...	1.69	18.7	...	59	...	F.	72	201	13	1	10
32	Diseases of Breast	620-621	1	35	14	205	.07	14.0	5.9	23	41	M.	22	68	14	...	12
33	Diseases of Female Genital Organs, Uterus, Ovary, Fall. Tubes, Parametrium	622-637	...	533	...	5,869	1.80	...	11.0	...	45	F.	62	110	10	...	3
34	Complications of Pregnancy	640-649	...	122	...	743	.23	...	6.1	...	...	M.	1	8	3	...	1
35	Abortion	650-652	...	453	...	1,573	.48	...	3.5	...	28	F.	...	13	...	...	...
36	Delivery Complications and Complications of Puerperium	660-689	...	18	...	133	.04	...	7.4	...	29	M.	...	353	83	1	...
37	Diseases of Skin and Cellular Tissue	690-716	365	329	6,397	6,418	3.93	17.5	19.5	36	37	F.	22	92	...	...	...
38	Arthritis and Rheumatism except Rheumatic Fever	720-727	97	134	3,299	4,247	2.32	34.0	31.7	46	51	M.	142	307	4	...	...
39	Osteomyelitis and Other Bone and Joint Diseases	730-738	123	79	3,201	2,020	1.60	26.0	25.6	26	34	F.	6	11	...	...	5
40	Other Diseases of Musculoskeletal system	740-749	62	124	789	2,092	.88	12.7	16.9	34	47	M.	59	295	9	...	...
41	Congenital Malformations	750-759	263	177	3,483	2,418	1.81	13.2	13.7	8	12	F.	43	266	14	1	2
42	Birth Injuries, infections of newborn	760-776	60	43	648	463	.34	10.8	10.8	1	1	M.	3	77	17	...	...
												F.	1	113	19	...	...
												M.	13	90	18	...	...
												F.	4	66	8	...	...
												M.	10	47	4	...	...
												F.	20	96	8	...	...
												M.	34	122	94	...	13
												F.	16	91	57	1	12
												M.	10	41	3	...	6
												F.	7	28	6	...	2



43	Symptoms referable to systems or organs	780-789	619	522	6,414	5,064	3-52	10-4	9-7	40	36	M.	68	440	87	5	19
44	Ill-defined diseases	790-795	84	123	1,195	1,329	.78	14-2	10-8	48	43	F.	51	380	78	5	8
	Total	....	8,340	8,699	129,046	128,812	79-07	....	....	....	....	M.	2,432	11,590	1,966	32	1,019
45	Fractures of skull and face bones	N800-N804	202	68	3,527	790	1-32	17-5	11-6	28	27	M.	27	157	9	....	9
46	Fractures and Dislocations of Vertebral Column	N805-N806	39	19	3,073	2,202	1-62	78-8	115-9	36	40	F.	9	57	....	....	2
47	Other Fractures of Trunk, Sternum and Larynx	N807-N809	76	51	1,843	1,862	1-14	24-3	36-5	45	58	M.	....	16	8	....	2
48	Fractures of Upper Limb	N810-N819	208	128	1,238	456	.52	5-9	3-6	19	32	F.	4	71	....	....	1
49	Fractures of Lower Limb	N820-N829	338	290	11,968	14,922	8-25	35-4	51-5	39	60	M.	3	192	3	....	2
50	Dislocation without Fracture	N830-N839	38	26	432	277	.22	11-4	10-7	28	37	F.	12	121	2	....	1
51	Sprains and Strains	N840-N848	35	17	680	56	.23	19-4	3-3	40	24	M.	4	301	5	....	16
52	Head Injury excluding skull fracture	N850-N856	466	217	3,619	1,559	1-59	7-8	7-2	23	21	F.	24	240	4	....	22
53	Internal Injury of Chest, Abdomen, Pelvis	N860-N869	63	22	1,096	466	.48	17-4	21-2	32	27	M.	6	31	1	....	....
54	Lacerations, Contusions and Superficial Injuries	N870-N929	406	178	4,029	1,753	1-77	9-9	9-8	21	21	F.	7	19	....	....	....
55	Effects of foreign body entering through orifice	N930-N936	77	75	254	224	.15	3-3	3-0	22	33	M.	....	50	....	....	....
56	Burns	N940-N949	134	88	2,852	2,184	1-54	21-3	24-8	15	20	F.	31	43	1	....	....
57	Injury to Nerves and Spinal Cord without bone injury	N950-N959	13	5	281	107	.12	21-6	21-4	24	38	M.	21	106	3	....	4
58	Effects of Poisons	N960-N979	195	176	1,172	1,241	.74	6-0	7-1	15	25	F.	16	69	....	....	3
59	Effects of exposure and unspecified injuries and reactions	N980-N999	157	108	2,763	1,058	1-17	17-6	9-8	35	37	M.	2	9	....	....	....
	Total (N Categories)	....	2,447	1,468	38,827	29,157	20-85	....	....	....	....	....	498	3,203	106	4	104
60	Investigations, Observations and After-Care	Y00-Y10	55	24	172	110	.08	3-1	4-6	15	35	M.	12	39	4	....	....
	Total (Y Categories)	....	55	24	172	110	.08	....	....	....	....	....	13	57	9	....	....
	GRAND TOTAL	....	10,842	10,191	168,045	158,079	100%	....	....	....	....	....	2,943	14,850	2,081	36	1,123

\* Results :  
1 = Cured  
2 = Improved  
3 = Unchanged  
4 = Investigation only  
5 = Death.

Royal Perth Hospital, Fremantle Hospital and Princess Margaret Hospital  
OPERATION CASES DISCHARGED IN 1960

Item	Operation	Code of Surgical Operations	Number of Cases		Number of Days in Hospital		Per cent. of Total Oper'n Beds *	Average Number Days in Hospital		Average Age of Patients		Sex	Result				
			Male	Female	Male	Female		Male	Female	1	2		3	4	5		
1	Neurosurgery, Brain and Cerebral Meninges	001-019	121	68	4,428	2,462	4.31	36.6	36.2	37	42	M.	8	68	27	...	18
2	Neurosurgery, Spinal Cord and Spinal Meninges	020-029	37	28	1,169	701	1.17	31.6	25.0	23	23	F.	1	36	12	...	19
3	Neurosurgery, Peripheral Nerves and Sympathetic System	030-049	34	20	1,591	290	1.18	46.8	14.5	51	45	F.	6	17	7	...	1
4	Thyroid and Parathyroid	070-079	7	18	91	220	.20	13.0	12.2	28	44	M.	...	22	10	...	4
5	Adrenals	080-084	...	9	...	485	.31	...	53.9	...	47	F.	6	19	1	...	2
6	Pituitary, Thymus and Other Endocrine Organs	085-096	1	1	22	66	.06	22.0	66.0	44	43	M.	13	5	...	...	...
7	Ophthalmic Operations	100-199	296	305	3,318	4,263	4.74	11.2	14.0	36	46	F.	...	...	...	...	1
8	Ear, Nose, Throat, Pharynx, Tongue, Palate, Buccal Cavity	200-249 and 260-299	427	523	4,696	5,058	6.10	11.0	9.7	28	23	M.	29	255	12	...	...
9	Teeth and Gums	250-259	154	26	716	203	.57	4.6	7.8	9	23	F.	34	259	11	...	1
10	Heart and Pericardium and Intra-thoracic Great Vessels	300-329	52	60	895	1,088	1.24	17.2	18.1	15	18	M.	69	313	27	2	16
11	Lung, Bronchus, Mediastinum and Collapse Therapy	330-354	125	54	2,567	705	2.05	20.5	13.1	44	36	M.	160	332	24	...	7
12	Operations on Breast	380-389	3	77	44	1,482	.95	14.7	19.2	34	55	F.	80	73	...	...	1
13	On Abdominal Wall	400-419	318	202	5,397	3,973	5.86	17.0	19.7	46	50	F.	2	22	2	...	...
14	On Stomach	420-439	117	53	3,171	1,395	2.86	27.1	26.3	52	52	M.	3	25	19	...	...
15	On Appendix	440-449	226	227	2,194	2,091	2.68	9.7	9.2	25	25	F.	4	33	17	1	24
16	On Intestines except Appendix and Rectum	450-469	81	78	2,248	2,514	2.98	27.8	32.2	47	57	M.	12	71	30	...	21
17	On Rectum and Anus	470-499	72	75	1,342	1,424	1.73	18.6	19.0	45	52	F.	5	64	7	...	11
18	On Liver and Bile Ducts	500-529	56	125	1,542	2,835	2.74	27.5	22.7	62	59	M.	1	27	3	...	7
19	On Pancreas	530-539	3	...	56	...	.04	18.7	...	34	...	M.	117	109	...	...	...
20	On Spleen	540-549	6	3	72	33	.07	12.0	11.0	18	20	F.	100	124	1	...	...
21	On Kidney and Ureter	600-639	42	48	1,271	1,212	1.55	30.3	25.3	33	38	F.	15	48	7	...	...
22	On Bladder and Urethra	640-669	229	111	3,925	1,802	3.58	17.1	16.2	58	51	M.	18	59	1	...	...
												F.	8	79	20	...	4



OPERATION CASES DISCHARGED IN 1960—continued

Item	Operation	Code of Surgical Operations	Number of Cases		Number of Days in Hospital		Per cent. of Total Oper'n Beds*	Average Number of days in Hospital		Average Age of Patients		Sex	Result				
			Male	Female	Male	Female		Male	Female	1	2		3	4	5		
23	On Prostate and Seminal Vesicles	670-679	229	....	6,524	....	4.08	28.5	....	71	....	M.	42	160	8	....	19
24	Other Male Genital Organs	680-699	129	....	1,699	....	1.06	13.2	....	22	....	M.	31	93	4	....	1
25	On Ovary and Fallopian Tubes	700-719	....	76	....	703	.44	....	9.3	....	33	M.	....	....	....	....	....
26	On Uterus and Supporting Structures	720-739	....	411	....	4,205	2.63	....	10.2	....	44	F.	17	43	14	....	2
27	On Vagina, Vulva and Perineum	740-759	....	166	....	2,848	1.78	....	17.2	....	54	M.	84	259	66	....	....
28	Obstetric Operations (D. and C.)	760-799	....	414	....	1,398	.87	....	3.4	....	28	F.	28	123	15	....	....
29	Orthopaedic Surgery	800-899	768	661	20,184	23,207	27.15	26.3	35.1	33	49	M.	122	289	3	....	....
30	On Peripheral Blood Vessels and Lymphatic System	900-929	118	105	2,387	1,897	2.68	20.2	18.1	41	43	M.	65	657	24	....	22
31	On Skin and Subcutaneous Tissue	930-949	603	347	10,613	6,461	10.68	17.6	18.6	30	29	F.	71	553	13	....	24
32	Other Surgical Procedures	950-999	106	92	1,380	1,270	1.66	13.0	13.8	40	41	M.	12	60	36	2	8
												F.	18	59	24	....	4
												M.	117	473	10	....	3
												F.	79	266	2	....	....
												M.	2	81	14	....	9
												F.	2	69	17	....	4
	Total	....	4,360	4,383	83,542	76,291	100%	....	....	....	....	....	1,811	6,007	594	9	322

\* Operation Cases occupied one half of the total bed days.

To find the percentage of total beds occupied by the various types of operation cases, divide the percentage figure in Column 6 by 2.

ACCIDENTS, POISONINGS AND VIOLENCE, 1960

Accident	Number of Patients	Days in Hospital	Per cent. of Hospital Beds Occupied	Average Age of Patients	Number Died
Railway accidents ....	8	260	·08	42	....
Motor vehicle traffic accidents ....	1,123	24,521	7·52	29	34
Motor vehicle non-traffic accidents ....	32	835	·26	29	2
Other road vehicle accidents ....	103	712	·22	15	2
Water transport accidents ....	5	67	·02	26	....
Aircraft accidents ....	1	3	·0001	26	....
Accidental poisoning ....	239	1,613	·49	14	3
Accidental falls ....	846	19,838	6·08	40	41
Accidents caused by hot substance, corrosive or steam	125	2,091	·64	13	1
Other accidents ....	1,055	14,280	4·38	25	17
Medical and surgical complications and therapeutic mis- adventures ....	202	3,332	1·02	41	5
Late effects of injury ....	23	299	·09	10	....
Suicide and self-inflicted injury ....	156	1,518	·47	32	1
Homicide and assault ....	44	269	·08	35	....
Total ....	3,962	69,638	21·35	....	106



Appendix XXII

INCIDENCE AND MORTALITY OF NOTIFIABLE  
INFECTIOUS DISEASES

Diseases Notifiable	1957			1958			1959			1960		
	Cases Re- ported	Amend. Diag- nosis	Deaths	Cases Re- ported	Amend. Diag- nosis	Deaths	Cases Re- ported	Amend. Diag- nosis	Deaths	Cases Re- ported	Amend. Diag- nosis	Deaths
Acute Rheumatism ....	27	27	(A) 4	21	21	(A)3	15	15	(A) 7	14	14	(A) 7
Amoebiasis ....	4	4	....	1	1	....	1	1	1	5	5	....
Ankylostomiasis ....	....	....	....	1	1	....	1	1	....	....	....	....
Brucellosis ....	2	2	....	....	....	....	8	8	....	7	7	....
Chorea ....	1	1	....	1	1	....	2	2	1	3	3	....
Dengue Fever ....	....	....	....	....	....	....	1	1	....	....	....	....
Diphtheria ....	66	63	1	26	24	....	49	48	1	5	5	....
Dysentery (Amoebic) ....	6	6	....	1	1	....	1	1	1	5	5	....
Dysentery (Baeillary) ....	46	46	....	121	121	....	188	188	2	104	104	....
Enecephalitis, Lethargic ....	2	2	1	....	....	....	....	....	....	....	....	....
Erythema Nodosum ....	1	1	....	2	2	....	1	1	....	1	1	....
Hydatid ....	....	....	1	....	....	....	....	....	1	1	1	....
Infantile Diarrhoea ....	23	23	(B) 13	12	12	(B) 22	26	26	(B) 12	30	30	(B) 10
Infective Hepatitis ....	363	363	3	396	396	1	142	142	2	256	256	4
Lead Poisoning ....	1	1	....	1	1	....	2	2	1	2	2	1
Leprosy ....	33	33	....	38	38	....	18	18	....	18	18	....
Leptospirosis ....	....	....	....	....	....	....	2	2	....	9	9	....
Malaria ....	2	2	....	2	2	....	3	3	....	4	4	....
Meningococcal Infection....	6	6	....	9	9	2	3	3	4	4	4	2
Ornithosis ....	....	....	....	....	....	....	....	....	....	2	2	....
Paratyphoid ....	3	3	1	2	2	....	....	....	....	5	4	1
Polioomyelitis ....	9	3	1	3	1	....	3	3	....	14	7	....
Pleural Effusion ....	6	5	1	5	5	....	13	11	1	14	14	1
Puerperal Fever ....	2	2	....	1	1	....	3	3	....	1	1	1
Purulent Ophthalmia ....	9	9	....	30	30	....	50	50	....	67	67	....
Rubella ....	550	550	....	3,059	3,059	....	221	221	....	127	127	....
Salmonella Infection ....	21	21	1	45	45	....	40	40	....	28	28	....
Scarlet Fever ....	120	120	....	191	190	....	60	60	....	38	38	....
Tetanus ....	4	4	3	11	11	4	5	5	2	8	8	6
Trachoma ....	656	656	....	364	364	....	1,149	1,149	....	437	437	....
P.T.B. ....	347	327	35	388	350	23	345	309	24	322	282	28
Other T.B. ....	32	32	1	27	24	4	35	34	....	37	34	2
Typhoid Fever ....	9	9	....	22	22	2	8	8	1	1	1	....
Typhus Fever ....	7	7	....	5	5	....	6	6	....	....	....	....

Deaths include full-blood aboriginals.

(A) Rheumatic Fever.

(B) Gastro-Enteritis and Colitis (except ulceration) under two years and Diarrhoea of the new born.

Appendix XXIII

MATERNAL MORTALITY

Period							Average Live Births	Average Maternal Deaths	Average Rate
1901-1905	....	....	....	....	....	....	6,681	28·0	4·19
1906-1910	....	....	....	....	....	....	7,691	43·4	5·64
1911-1915	....	....	....	....	....	....	8,844	39·4	4·46
1916-1920	....	....	....	....	....	....	7,726	41·4	5·36
1921-1925	....	....	....	....	....	....	8,056	34·2	4·25
1926-1930	....	....	....	....	....	....	8,748	46·8	5·35
1931-1935	....	....	....	....	....	....	8,062	35·4	4·39
1936-1940	....	....	....	....	....	....	8,877	32·4	3·65
1941-1945	....	....	....	....	....	....	10,408	24·4	2·34
1946-1950	....	....	....	....	....	....	13,130	21·4	1·63
1951-1955	....	....	....	....	....	....	15,724	13·8	0·88
1956-1960	....	....	....	....	....	....	16,922	8·2	0·48

Year				Live Births	Deaths From									
					Puerperal Septicaemia		Other Puerperal Infections		Abortion		All other Complications of Pregnancy and of the Puerperal State		All Compli- cations of Pregnancy and the Puerperal State	
				No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	
1943	....	....	....	10,481	2	0·19	1	0·10	3	0·29	17	1·62	23	2·19
1944	....	....	....	10,870	2	0·18	2	0·18	5	0·46	18	1·66	27	2·48
1945	....	....	....	10,672	....	....	2	0·19	5	0·47	13	1·22	20	1·87
1946	....	....	....	12,105	....	....	3	0·25	5	0·41	18	1·49	26	2·15
1947	....	....	....	12,874	1	0·08	1	0·08	8	0·62	22	1·71	32	2·49
1948	....	....	....	12,981	2	0·15	4	0·31	1	0·08	13	1·00	20	1·55
1949	....	....	....	13,511	....	....	2	0·15	3	0·22	11	0·81	16	1·18
1950	....	....	....	14,228	....	....	2	0·14	1	0·07	12	0·84	13	0·91
1951	....	....	....	14,794	....	....	2	0·14	3	0·20	11	0·74	16	1·08
1952	....	....	....	15,413	....	....	3	0·19	3	0·19	12	0·78	18	1·17
1953	....	....	....	15,862	....	....	....	....	1	0·06	8	0·50	9	0·57
1954	....	....	....	15,928	....	....	....	....	5	0·31	7	0·44	12	0·75
1955	....	....	....	16,623	....	....	....	....	1	0·06	13	0·78	14	0·84
1956	....	....	....	16,916	....	....	....	....	2	0·12	7	0·41	9	0·53
1957	....	....	....	16,924	....	....	....	....	3	0·18	8	0·47	11	0·65
1958	....	....	....	16,731	....	....	....	....	1	0·06	7	0·42	8	0·48
1959	....	....	....	17,111	....	....	....	....	1	0·06	4	0·23	5	0·29
1960	....	....	....	16,926	1	0·06	....	....	3	0·18	4	0·24	8	0·47

All Rates per thousand live births

Place							1958	1959	1960
Western Australia	....	....	....	....	....	....	0·48	0·29	0·47
New Zealand (a)	....	....	....	....	....	....	0·41	0·49	....
New South Wales	....	....	....	....	....	....	0·65	0·67	....
Victoria	....	....	....	....	....	....	0·31	0·26	....
Queensland	....	....	....	....	....	....	0·47	0·59	....
Tasmania	....	....	....	....	....	....	0·09	0·02	....
South Australia	....	....	....	....	....	....	0·30	0·30	....

(a) Non-Maori.



## Appendix XXIV

## STILLBIRTH AND INFANT MORTALITY RATES

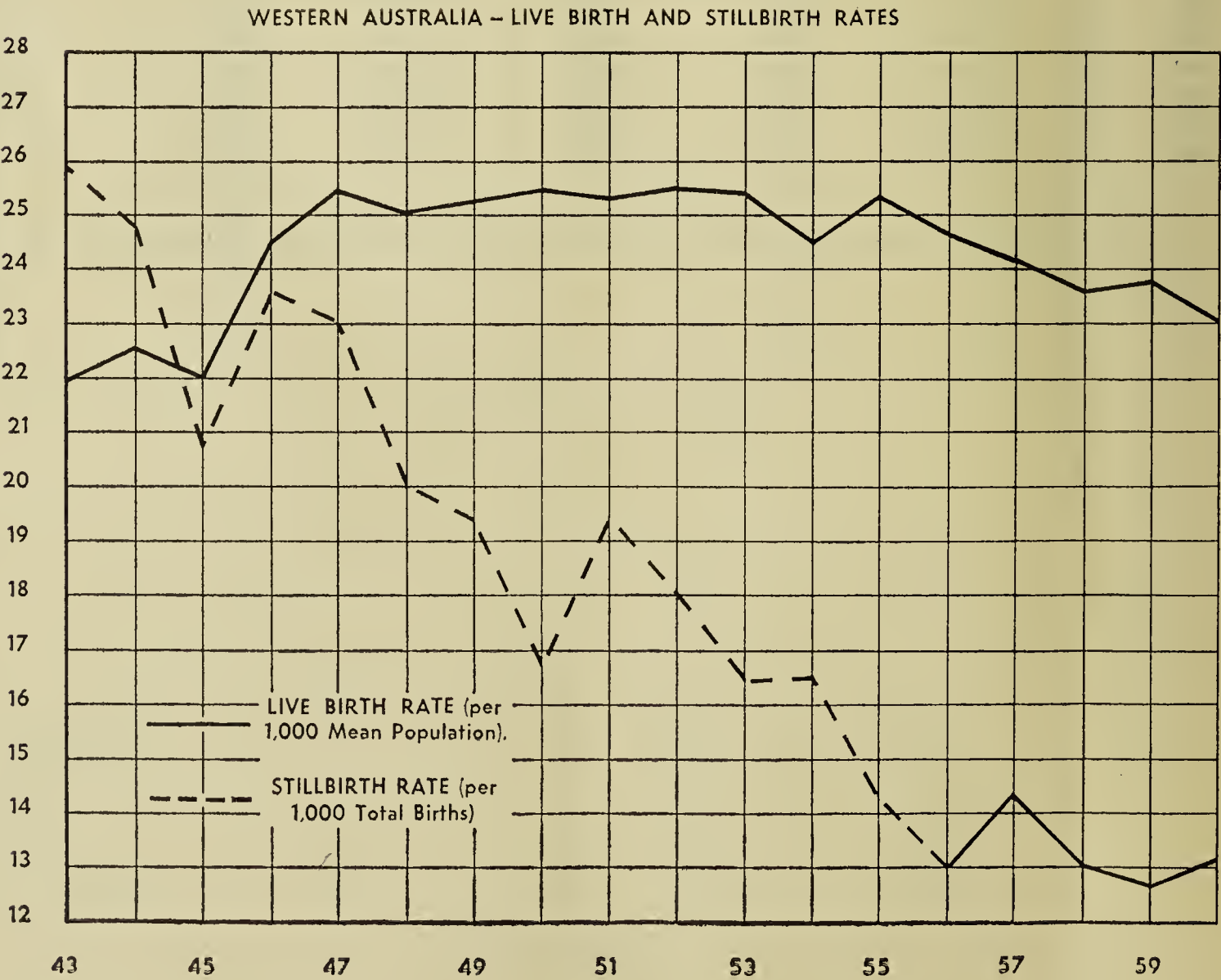
Year	Total Births including Stillbirths	Stillbirth Rates	Neo-Natal Rates.		Total Mortality Rates under One Year	Other Post Natal Rates Over One Month and Under One Year
			Under One Week	Under One Month		
1931	8,777	26.0	20.1	26.6	40.5	13.9
1932	8,175	25.7	21.02	25.2	43.5	18.3
1933	8,105	29.4	18.1	22.5	35.8	13.3
1934	8,029	29.2	19.3	24.8	38.8	14.0
1935	8,377	30.8	20.6	24.8	39.0	14.2
1936	8,730	28.9	19.6	24.8	41.0	16.2
1937	8,850	27.2	16.8	21.2	36.5	15.3
1938	9,325	23.9	16.6	19.1	33.1	14.0
1939	9,249	23.0	16.5	19.7	40.0	20.3
1940	9,365	25.9	20.5	24.9	43.0	18.1
1941	10,375	24.6	15.1	18.1	34.4	15.7
1942	10,109	20.6	17.1	20.3	36.2	15.9
1943	10,759	25.8	17.1	21.0	31.8	10.8
1944	11,144	24.8	18.6	21.0	32.0	11.0
1945	10,896	20.6	18.0	20.0	28.9	8.9
1946	12,398	23.1	17.1	20.6	30.3	9.6
1947	13,178	23.2	16.9	19.4	30.2	13.2
1948	13,197	20.5	16.9	18.7	25.0	8.4
1949	13,779	19.4	16.2	19.0	25.9	6.8
1950	14,468	16.6	16.2	18.0	26.7	8.6
1951	15,091	19.7	16.2	19.7	28.2	8.5
1952	15,697	18.1	15.5	17.7	24.5	6.8
1953	16,130	16.6	13.4	16.2	23.4	7.3
1954	16,198	16.7	14.2	15.8	22.2	6.4
1955	16,862	14.2	13.3	15.8	22.1	6.3
1956	17,142	13.2	13.0	15.7	22.4	6.7
1957	17,169	14.3	13.6	14.9	20.8	5.9
1958	16,956	13.3	12.8	14.2	21.2	7.1
1959	17,336	13.0	12.3	13.6	19.9	6.3
1960	17,152	13.2	13.9	15.7	21.3	5.7

In above table all rates are calculated in deaths per 1,000 of total births, including stillbirths.

Appendix XXV

WESTERN AUSTRALIA – STILLBIRTH AND BIRTH RATES

Year	Mean Population	Live Births		Stillbirths	
		Number	Rate per 1,000 Mean Population	Number	Rate per 1,000 Total Births
1943	476,745	10,481	21.98	278	25.84
1944	481,498	10,870	22.58	274	24.59
1945	487,510	10,672	21.89	224	20.56
1946	492,771	12,105	24.57	293	23.63
1947	502,951	12,874	25.60	304	23.07
1948	514,621	12,931	25.13	266	20.16
1949	532,603	13,511	25.37	268	19.45
1950	557,878	14,228	25.50	240	16.59
1951	580,317	14,794	25.49	297	19.68
1952	600,615	15,413	25.66	284	18.09
1953	621,034	15,862	25.54	268	16.62
1954	640,140	15,928	24.88	270	16.67
1955	658,747	16,623	25.23	239	14.17
1956	677,317	16,916	24.98	226	13.18
1957	691,723	16,924	24.47	245	14.27
1958	705,600	16,731	23.71	225	13.27
1959	718,830	17,111	23.80	225	12.98
1960	731,403	16,926	23.14	226	13.18





Appendix XXVI  
MEAT INSPECTION FOR YEAR ENDED 31ST DECEMBER, 1960

Number and Type of Animals Slaughtered	Carcases Condemned for—							Part Carcases Condemned for—							Organs Condemned for—							
	Tuber- culosis	Actino- mycosis	Pirop las- mosis	Caseous Lympha- denitis	Para- Typhoid	Trau- matic and Septic Conditions	Pleuro- Pneu- monia	Other Abnorm- alities	Carcases Con- demned Totals	Actino- mycosis	Caseous Lympha- denitis	Tuber- culosis	Arth- ritis	Other Abnorm- alities	Part Car- cases Con- demned Totals	Actino- mycosis	Echino- coccosis	Pleuro- Pneu- monia	Tuber- culosis	Other Abnorm- alities	Organs Con- demned Totals	
Robb's Jetty (including Watson's)																						
Cattle ...	18	...	11	...	...	72	1	12	114	127	...	3	...	51	181	202	75	...	...	21	784	1,082
Calves ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sheep ...	...	...	...	23	...	201	...	417	641	...	448	...	509	33	990	...	238	...	...	...	15,103	15,341
Pigs ...	82	...	...	...	12	21	...	153	268	...	...	1,148	48	9,422	10,618	...	...	...	4	48,687	48,691	
Midland Junction (including Foggitt's)																						
Cattle ...	82	...	4	...	...	80	5	56	227	298	...	78	...	105	481	431	144	...	11	1,307	1,893	
Calves ...	...	...	...	...	...	1	...	4	5	...	...	...	...	1	1	...	...	...	...	...	...	...
Sheep ...	...	...	...	185	...	382	...	3,499	4,066	...	781	...	875	21	1,677	...	...	...	...	65,338	65,338	
Pigs ...	19	...	...	...	21	7	...	22	69	...	...	63	92	74	229	...	22	...	5	7,787	7,814	
Kalgoorlie																						
Cattle ...	...	...	...	...	...	...	...	...	...	29	...	4	...	2	35	1	...	...	2	43	46	
Calves ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Sheep ...	...	...	...	5	...	11	...	...	43	...	86	...	53	23	162	...	39	...	...	3,781	3,820	
Pigs ...	...	...	...	...	...	...	...	4	4	...	...	15	...	9	24	...	...	...	...	234	234	
Perth Meat Markets																						
Cattle ...	...	...	...	...	...	2	...	6	8	...	...	...	...	24	24	...	...	...	...	56	56	
Calves ...	...	...	...	...	...	...	...	41	41	...	...	...	...	4	4	...	...	...	...	30	30	
Sheep ...	...	...	...	...	...	...	...	28	28	...	...	...	...	...	...	...	...	...	...	105	105	
Pigs ...	4	...	...	...	2	1	...	6	13	...	...	...	...	...	...	...	...	...	...	16	16	
Fremantle Meat Markets																						
Cattle ...	...	...	...	...	...	...	...	2	2	...	...	...	1	1	2	...	1	...	...	1	2	
Calves ...	...	...	...	...	...	...	...	3	3	...	...	...	...	...	...	...	...	...	...	...	...	
Sheep ...	...	...	...	...	...	...	...	3	3	...	...	...	...	...	...	...	...	...	...	...	...	
Pigs ...	3	...	...	...	3	1	...	7	14	...	...	2	2	...	4	...	...	...	...	...	...	
*Country Districts																						
Cattle ...	44	...	...	...	...	36	...	24	104	54	...	40	...	82	176	145	143	...	49	691	1,028	
Calves ...	...	...	...	...	...	...	...	112	112	...	...	...	...	...	...	...	...	...	...	4	4	
Sheep ...	...	...	...	26	...	84	...	661	771	...	221	...	326	117	664	...	639	...	...	8,865	9,504	
Pigs ...	12	...	...	...	44	9	...	16	81	...	...	62	58	45	165	...	9	...	16	1,808	1,840	
Totals—																						
Cattle ...	98,553																					
Calves ...	18,274																					
Sheep ...	1,461,449																					
Pigs ...	151,491																					
	1,729,767																					

\* Country Districts includes following areas :—  
Albany, Busselton, Collie, Dardanup, Drakesbrook, Geraldton, Harvey, Katanning, Mandurah, Manjimup, Northam, Narrogin, Wagin.  
Merredin—No inspection carried out.

# APPENDIX XXVII REVENUE AND EXPENDITURE FOR THE YEAR 1960

## REVENUE

	£	s.	d.
Licence Fees .....	79	5	0
Meat Inspection Fees .....	22,477	15	2
Fish Inspection Fees .....	984	8	4
Pathological Laboratory .....	4,054	1	9
Sanitation Refunds .....	185	11	7
Inspection of Plans (Septic Tanks) .....	18,933	11	2
Miscellaneous .....	5,669	0	5
Nurses and Midwives Registration and Examination Fees .....	3,423	2	0
T.B. Diagnosis (Generally) .....	509,018	11	9
T.B. Diagnosis—			
Wooroloo .....	68	0	9
Perth Chest Hospital .....	13,066	15	10
Health Supervision Charges .....	37	10	0
Baby Patterns .....	12	15	0
Hospital Benefits—Lepers .....	292	16	0
Supplementary and Organisation Benefits—Lepers .....	182	8	0
Poliomyelitis After-care .....	663	11	0
Immunised Diphtheria .....	80	11	0
Infectious Diseases .....	11,998	12	8
Pesticide Registration .....	331	1	0
T.B. Laboratory Fees .....	30,594	9	6
	£622,153	17	11

## EXPENDITURE

Salaries (including Tuberculosis) .....	597,083	18	5
Infectious Diseases .....	25,363	6	4
School Medical Doctors and Nurses Travelling .....	4,342	3	3
Dental Bursaries .....	8,928	13	10
School Dentists Travelling and Expenses .....	4,646	18	11
School Medical and Dental Services, other Expenditure .....	16,458	3	11
Travelling and Transport Generally .....	4,583	8	11
Travelling and Transport Commissioner and Medical Officer .....	2,084	19	2
Ophthalmic Survey .....	3,901	10	8
Postage and Telephones .....	1,762	8	6
Laboratory .....	44,414	17	3
Venereal Diseases .....	3,063	10	9
Infant Welfare Centres .....	102,348	7	9
Maintenance and Transport, Lepers .....	23,946	14	4
Poliomyelitis .....	18,847	15	4
Sanitation, Government Buildings .....	15,795	8	8
Tuberculosis Clinics .....	291,680	16	11
Miscellaneous .....	19,413	7	0
	£1,188,666	9	11











